UNIVERSIDAD DE JAÉN

FACULTAD DE CIENCIAS SOCIALES Y JURÍDICAS

DEPARTAMENTO DE ECONOMÍA FINANCIERA Y CONTABILIDAD

TESIS DOCTORAL

A HOLISTIC MODEL FOR EARNINGS QUALITY MEASUREMENT USING PARTIAL LEAST SQUARES

PRESENTADA POR:

ANA LICERÁN GUTIÉRREZ

DIRIGIDA POR:

DR. D. MANUEL CANO RODRÍGUEZ

DRA. DÑA. PILAR GÓMEZ FERNÁNDEZ-AGUADO

JAÉN, 10 DE ENERO DE 2019

ISBN 978-84-9159-262-4

CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

_Toc529641911

AGRADECIMIENTOS

Si hoy escribo estas líneas sintiéndome cargada de felicidad es gracias al Señor, mi Buen Pastor, quien me sostiene y me empuja a seguir con la tranquilidad de que me lleva de Su mano… Luego mi mayor agradecimiento es a Él. Todo lo puedo en Aquél que me conforta.

Aún recuerdo esa tarde fría, allá por octubre de 2011, en que entré al despacho 160… Me había dicho José Carlos: "*Ana, si fueras mi hija yo te aconsejaría que como director en esta nueva etapa que quieres empezar elijas a Manuel Cano… habla con él y déjate llevar… no te vas a arrepentir*" (muchas gracias, José Carlos, por los muchos consejos que me has dado… y éste, un grandísimo consejo gracias al cual hoy estoy donde estoy, habiéndome ayudado a crecer como persona). Y así entré al 160, el inicio de todo… Me senté a hablar con Manolo y, desde entonces, en ese momento con la tesina y luego con la tesis, comenzó una aventura fantástica en la cual Manolo ha sido el mejor guía que nadie pudiera imaginar.

Y ahí estaba yo, con los ojos expectantes… Calidad contable… pero eso qué será… dónde me voy a meter con lo tranquilita que estaba después de los seis años de carrera… Y ese día Manolo empezó a darme la primera gran lección de vida: buscar cada uno la propia respuesta. Manolo, muchas gracias por ayudarme a sacar por mí misma lo mejor que pueda tener… Tienes un método de trabajo que me encanta: "*Ana, yo no voy a darte la respuesta ni a ésa ni a otras preguntas… Tú puedes y tienes capacidad más que suficiente para llegar a la solución. Ahora, eso sí, voy a guiarte siempre para que, por ti misma, llegues a la solución… ¿Te animas entonces a empezar este proyecto?*"… Y a mí que me van los retos no me quedó otra que aceptar e irme a casa con la tarea de leer yo justo para dar respuesta a qué era eso raro de la calidad contable… El tema que a lo largo de estos siete años me ha acompañado.

Defendida con alegría la tesina tras dos años de investigación, en un curso en Sevilla nos llegó a Manolo y a mí la inspiración para la tesis… Nos dio José Luís Roldán una charla estupenda sobre el PLS y a la vez nos miramos sabiendo que se nos estaba ocurriendo la misma idea… ¿Y si juntamos la calidad contable con el PLS? Y de ahí, el reto de la tesis… medir calidad contable con PLS. De nuevo a investigar qué hay sobre eso... Y aquí recibí de Manolo mi segunda gran lección de vida… Le dije con la cabeza agachadilla que no había encontrado nada en contabilidad financiera aunque sí en otras áreas y que si nadie lo había hecho, cómo íbamos a meternos ahí. Su respuesta: "*Llega una persona a mitad de la selva cargado de zapatillas y ve que allí todo el mundo va descalzo… La mayoría de la gente diría que es absurdo tratar de vender zapatillas allí si nadie las usa, pero si eres buen investigador no te quedas ahí… allí hay un gap que nadie ha cubierto y una oportunidad para vender esas zapatillas porque igual hasta entonces nadie había visto lo bien que les podía venir… No abandones y trata de vender esas zapatillas si crees que son buenas*"… Eso me ayudó a cambiar el chip para todo… Mil gracias, Manolo, por hacerme ver que lo que parece complicado de lograr porque nadie lo ha hecho no es más que el impulso para solucionar un problema y marcar la diferencia.

Y termino mi agradecimiento a Manolo con una frase que me impactó y que tengo grabada en la frente… "*Lo que parece complicado, vamos a lograrlo hoy. Lo que es imposible, lo lograremos como muy tarde, mañana*". Gracias, Manolo, porque contigo he aprendido mucho (incluso a programar el Stata, ¿eh?), he desarrollado la creatividad, he entendido el valor del esfuerzo y del hacer las cosas por mí misma sin esperar que me den la respuesta, he aprendido a investigar… pero sobre todo, me has ayudado a madurar y crecer como persona… No tendría con qué agradecerte tanto… Eres un gran director y un estupendísimo coach capaz de sacar lo mejor de cada persona. Gracias infinitas por todo.

Muchas gracias a mis codirectores: Pilar Gómez e inicialmente Antonio Partal, por estar siempre dispuestos a ayudarme en todo cuanto he necesitado, por haberme incluido en el grupo de investigación y por apostar por mí aun suponiendo a veces para vosotros perder otras oportunidades. Gracias por todo vuestro apoyo.

En mi vida hay dos personas sin las cuales no sería nada y gracias a las cuales soy todo: mis padres, Luisa y Manuel. Para ellos dos necesitaría escribir un tratado entero de agradecimientos y aun así, nunca en la vida podría llegar a agradecerles todo lo que les debo en la vida… Hace 32 años, un lluvioso día de marzo con aquel "sí, quiero" dijeron que querían muchas cosas… Un proyecto precioso que hoy continúa y que es un ejemplo para todos nosotros… Y no quedó ahí la cosa… Decidieron compartir su amor con alguien más… Y yo tuve la gran suerte de ser la partícipe de aquel gran proyecto. Y desde que nací no he parado de recibir cada día todo el amor que me hace ser la persona más feliz del mundo…

Gracias, mamá y papá, por amarme tanto, por daros enteros para que yo sea feliz a cambio de nada… Gracias por educarme con paciencia cada día ayudándome a entender que lo importante en la vida es, por encima de todo, algo muy sencillo: ser felices haciendo a los demás. Y todo esto no sólo lo habéis dicho… sino que lo veo a diario en vosotros… Dice el Evangelio que Jesús "enseñaba todo esto con autoridad" justamente porque su vida era reflejo de su mensaje… Gracias porque como padres puede ser fácil decir muchas palabras… pero lo que es un reto y muy pocos logran es decirlas con la "autoridad" de estar viviéndolas. Sois para mí un gran referente, el mayor de todos, el mejor espejo donde mirar para intentar imitar y reflejar lo buenos que sois. Ojalá algún día llegase a ser la millonésima parte de lo buenas personas y grandes profesionales que sois… Gracias por toda esa educación que gota a gota ha ido puliendo esa piedra tosca hasta hacerla algo más bonita.

Además de la educación envuelta en amor permanente, os quiero dar las gracias por otro gran regalo que me habéis dado desde que nací: la fe. Gracias a ese regalo, como comenzaba en estas palabras de agradecimiento, hoy puedo mantenerme en pie y encontrar mi alegría. Gracias no sólo por hacerme partícipes de la enorme suerte de tener como compañero al Señor, sino por ser además los mejores transmisores de su

mensaje con vuestra propia vida, una vida de buena noticia para todo el que pasa por vuestro camino.

Gracias a los dos por hacer de este paquetillo el ser más feliz, aun a costa de vosotros sufrir muchas veces los efectos colaterales… Este agradecimiento también lleva implícita una disculpa… Gracias por aguantar con paciencia todo el estrés que me ha llevado esta tesis… Dicen que lo pagas con quien más quieres y así es… Habéis soportado estoicamente todos mis cabreos y mal humor por esta tesis… Vosotros no habéis hecho más que darme cariño, apoyo y comprensión… y yo soy consciente de todo ello y me arrepiento infinitamente de todas las sonrisas que os he robado, de las malas caras por esta situación de estrés, de la irascibilidad con todo… No tenía ningún derecho porque si algo he recibido de vosotros es un inmenso amor… No me cabe más que decir, lo primero, que lo siento… Y lo segundo que GRACIAS INFINITAS porque ante esto no ha habido nunca un reproche sino una respuesta de un amor mucho mayor y más fuerte… Dicen que detrás de un gran investigador hay siempre una gran familia que lo apoya… y yo no soy una gran investigadora… pero sí que aun siendo un mini proyecto de investigadora, tengo detrás (yo prefiero decir al lado) a los mejores padres que nadie pudiese nunca imaginar…

Me habéis dado la vida, la educación, la fe, el mejor amor, la alegría, los valores… Sólo me cabe decir que MUCHÍSIMAS GRACIAS por tanto a cambio de nada. Ojalá algún día pudiera recompensaros en la mínima parte de lo que a cada instante me dais. OS QUIERO INFINITO.

Como comentaba, detrás de un investigador hay siempre una gran familia… Y yo tengo la mejor… Gracias, Tatu, por ser mi segunda madre desde el día en que nací y cuidarme cada día dándome todo tu cariño. Gracias por esas súper comidas de chef que disfruto tanto a diario. Y muchas gracias por transmitirme tu experiencia… experiencia de una vida de sacrificio, entrega a los demás y lucha para seguir adelante. No podría recibir mejores lecciones. Gracias por estar siempre ahí.

Gracias a mis titos: Paco (mi Rorro, desde peque…), Blanca, Eliseo y María Luisa; y a mis primos: Pablete (mi niño… desde que naciste has sido la alegría de la casa… siempre atento, con tu sonrisa, hablando de todo, tan aplicado… Y yo tuve el regalo del Señor de ser tu madrina… Ya estás regalándonos mucha felicidad… y la que nos queda por ver… vas a ser un estupendo médico… ve a por ello, Pablo… con esfuerzo se logra y sé que me vas a hacer ese regalo de verte radiante y feliz dedicándote a lo que más deseas. Nunca te canses de luchar… Lucha por ti, siempre); Jesús (lograr sueños cuesta mucho, lo sé… pero no hay nada imposible… Sólo hay que perseverar… Y sé que vas a ser el mejor chef que ha dado la cocina. Para cocinar hay que tener paciencia, pero ese caldo a fuego lento hace que todo tenga mejor sabor… No te rindas nunca, intenta siempre avanzar… No importa lo que hayas pasado, importa lo que está por llegar, importa que disfrutes del viaje hasta llegar a la meta y que lo hayas peleado. Estoy muy orgullosa de ti y con ganas de disfrutar de todo lo que me tienes preparado… Da igual las vueltas que tengas que dar… sigue adelante y hazme el regalo de ser feliz con lo que hagas); David (cariñoso como nadie, dulce, tierno… y reflejando siempre en tu cara esa felicidad de vivir haciendo lo que te gusta. Qué feliz me hiciste al elegirme madrina de confirmación… un regalo del Señor y de los grandes… Cada día me das lecciones de vida… Gracias por enseñarme que para ser feliz basta con dejarse llevar y disfrutar las pequeñas grandes cosas que da la vida… esa lección, que tú vives a diario, es la mejor clase magistral que nadie podría dar… Y muchas gracias por ofrecer a toda la humanidad algo muy necesario y que pocas veces se valora… La música que llena de armonía todo… Gracias por apostar por tus sueños y decidir dedicarte en cuerpo y alma a ser el mejor flautista y traverso que ha dado la Historia… Sigue llenándonos de vida porque no hay mayor felicidad que ser feliz haciendo felices a los demás); Ana (siempre inseparables… nos unen tantas cosas… desde pequeñas jugábamos juntas, íbamos de fuente en fuente, reíamos contándonos nuestras cosas… y hasta demostrábamos dotes musicales con nuestro dúo An y Ana. Gracias a ti he podido vivir muchos buenos momentos. Hoy eres para mí un gran apoyo y una gran compi para seguir compartiendo alegrías. Eres una estupenda enfermera! Cada día me das lecciones de lo que es ser feliz cumpliendo tu vocación y de la manera tan estupenda que lo haces. Sé que pronto celebraremos tu EIR y, si ya estoy muy orgullosa de ti, más radiante estaré aún de verte cumplir ese gran sueño. Gracias por todo, Ana); y Paco (gracias por tu ejemplo de constancia y perseverancia para ir alcanzando lo que te propones. Avanzando paso a paso has ido mejorando hasta cumplir todos y cada uno de tus sueño. Nos hiciste muy feliz uniendo tu vida a una persona maravillosa que hoy por hoy es parte esencial de nuestra familia: Joanna. Gracias infinitas, Joanna, por ser el auténtico ejemplo que da sentido a la palabra "amor"; has dejado mucho para apostar por tu gran felicidad… y gracias a tu valentía Paco es plenamente feliz, y nosotros más aún de veros a ambos. Gracias por ser tan atenta con todos nosotros y estar siempre pendiente de preguntar, apoyarnos en los retos, felicitarnos en cumples y santos… y por dejar una gran huella en nosotros. Paco y Joanna, muchísimas gracias a los dos).

Dicen que "haz de tu trabajo tu pasión y nunca tendrás que trabajar"… Así es… Y en estos ocho años que llevo viviendo esa pasión en mis diferentes trabajos, puedo decir que no sólo he ganado en conocimientos sino también en experiencia personal… y en encontrar tres grandes familias donde me siento acogida. Mi tesis va dedicada, por supuesto, a estas tres grandes familias. Empiezo desde la primera hasta la más reciente.

Aún recuerdo con cariño ese 8 de marzo de 2011… Recién acabada la carrera en febrero, y aún sin todas las notas, hice mi primera entrevista de trabajo… Yo pensaba, no me cogen ni en broma sin experiencia… Pero ahí estaba el día internacional de la mujer firmando mi primer contrato gracias a la apuesta personal de Francisco Muriana y Manuel Molinero. Y ahí empezó una etapa preciosa de casi un año que me ayudó muchísimo a crecer como persona y, por supuesto, a poner en práctica lo estudiado para darle sentido a lo que hoy por hoy investigo e imparto como docente: la contabilidad. Pero más importante incluso es la familia que de ahí me llevo… María (gracias por ser una hermana para mí, por tratarme con tanto cariño desde el día en que, asustadilla, te pregunté dónde era esa entrevista de trabajo… por escucharme en mis malos ratos, por interesarte siempre por mí, por enseñarme a ir haciendo todo… y todo ello con la mejor sonrisa… No sólo gané una gran compi, sino a toda una hermana); Jero (decía Machado "*ser, en el buen sentido de la palabra, bueno*"… Gracias Jero por ser un estupendo compañero de curro y amigo. Gracias porque desde el primer día me has dado una gran lección: que siendo una persona absolutamente sencilla y humilde, esa humildad hace sencillamente gigante a la persona… Desde lo pequeño, sin llamar la atención, sin hacerte ver para los demás, sin buscar el reconocimiento, estás dispuesto a entregarte a los demás, atento a todo lo que necesitamos… con cariño, con esa gran sonrisa y sin darte jamás el mérito tan enorme que tienes… gracias a ti aprendí muchísimo del trabajo auditor en la oficina… sí… pero sobre todo del ser buena persona dándote el mérito no tú, sino la huella que dejas en los demás… y esa lección no la olvidaré jamás); Rafa (compañero de fatigas, gran maestro del manejo de Excel y de la contabilidad, y con un corazón enorme… Firmamos contrato casi a la vez, y desde aquel día me has ayudado muchísimo a mejorar usando recursos, a perfeccionar en Excel, a comentar resultados (créeme que cuando explico análisis contable hay mucho de tus lecciones en cada explicación)… gracias también por ayudarme a entender el valor de la valentía para afrontar cambios y avanzar… ¡gracias, súper crack!); José (mi gran maestro… sabes que así te considero… he aprendido tanto gracias a ti… recuerdo ese día camino de Noalejo "*Ana, no te preocupes que verás como llegará un día en que harás pum y todo lo que has aprendido y llevas dentro va a salir, vas a verle sentido a todo, a conectar lo que sabes con la práctica… y entonces vas a ver lo chula que es la contabilidad*"… y así fue… cada día con paciencia infinita me ibas instruyendo… yo absorbía esa maestría que calaba poco a poco en mí… y llegó ese pum… Te dije "*José, ahora sí… ha llegado ese pum*"… Gracias por ser el gran empujón para ese pum y por trabajar cada día para pulir eso que llevaba dentro… Gracias a eso entendí la contabilidad y empecé a amarla… tanto como que hoy me dedico a ella investigadora y docentemente… Eres un gran maestro, maestro porque no sólo eres un gran docente (podrías venir a dar clase… lo harías genial…) sino porque a eso se suma que lo haces realidad desde tu experiencia. Gracias, José… Gracias, maestro); Paco C (eres la alegría en persona… no había nada más motivador que llegar un lunes a las 9 y encontrarme con tu enérgico "*buenos días, hoy es un precioso lunes, vamos a por la semana*"… eso era una inyección de positividad con la que poder afrontar todo. Gracias, Paco, por enseñarme el valor de la alegría estés como estés… esa lección me ha ayudado todo este tiempo porque más de una vez mis días parecían lunes… pero me acordaba de tu "precioso lunes" para tirar para adelante… Gracias también por transmitirme con tu ejemplo que una persona es grande cuando sabe tratar por igual y con el mismo cariño a todos); y Luís Ramón (gracias por tu gran humanidad y por enseñarme el valor de la profesionalidad y el hacer bien las cosas como base de todo). A mi familia Foro… Gracias por quererme como a una hija y hacerme sentir como en casa. Va por todos vosotros

Voy ahora a mi segunda gran familia laboral… a nuestro E-Team. La vida me ha hecho el regalo de pasar dos años fantásticos en mi gran familia de la Academia Épsilon. Llevaba unos meses en paro y yo seguía con ganas de docencia… Y llegué currículum en mano a la Academia. Allí me esperaba la enorme sonrisa de una más que enorme persona: Cristina. Mi sorpresa fue cuando Raúl se acercó y me dijo “bienvenida, te estábamos esperando”… Esa enorme confianza en mí fue todo un soplo de energía que me animó bastante. Y así, gracias a Raúl y a José, la vida me regaló una preciosa experiencia y una gran familia. Raúl y José, he aprendido muchísimo de vosotros… Día tras día me habéis ayudado a darle sentido a mi gran pasión, la docencia… Sois para mí (y creo que para muchísima gente) todo un ejemplo de profesionalidad, de tirar para adelante y buscar recursos, de emprender… Hablamos tanto de emprendimiento… Emprender es, los dos habéis hecho, dejar atrás la comodidad para apostar por conseguir un sueño y trabajar duro para alcanzarlo… Gracias a los dos por haberme transmitido el valor de emprender proyectos y pelear con ilusión por ellos. Mil gracias también por haberme demostrado qué es la palabra docencia… Con vosotros, esa palabra tan bonita cobra todo su sentido… Ser docente no es sólo decir palabras sobre un tema… es despertar inquietudes de conocimiento en los alumnos gracias a esas palabras y ayudarles a descubrirse a ellos mismos para dar lo mejor de sí ante cualquier circunstancia. Y eso lo lográis cada día… lo veo en los alumnos y es increíble su avance… les hacéis sacar esa garra que necesitan para saber que pueden y van a lograr superar las asignaturas. Hay quien dirá que eso es suerte… Yo digo que, en palabras del economista Rovira, “*la buena suerte es la suma de esfuerzo y oportunidad*”… la oportunidad os ha llegado, sí… pero el esfuerzo lo habéis puesto vosotros… y ahí está el resultado… éxito empresarial. Gracias por todas estas grandes lecciones que me han ayudado profesional y personalmente… Y muchas gracias por haberme hecho sentir en familia todo el equipo, nuestro E-Team: Raúl, José, Cristina, Inma, Montse, Manu, Juan y Gema… Entre vosotros me he sentido arropada, querida y muy cómoda desde el minuto uno… He visto en vosotros una piña de grandes personas, y hoy por hoy siento que no me he ido de allí, y me siento E-Team… Sois geniales todo el equipo. Os quiero infinito, lo sabéis.

Y voy ahora con mi actual familia, mi familia UJA, de la cual me siento encantada de formar parte. Muchas gracias a todos mis compañeros del Departamento de Economía Financiera y Contabilidad y, por supuesto, también del Departamento de Organización de Empresas, Marketing y Sociología, que siempre hacemos piña compartiendo buenos momentos. Desde que llegué, me he sentido una más… Entré el primer año de sustituta interina nueve meses después de acabar la carrera… Una sensación curiosa… hacía nada yo recorría esos pasillos y entonces era compañera de trabajo… Pero bastaron minutos para sentirme parte del equipo, otra más, como si llevase años… Creedme que es para mí un lujazo llegar a trabajar cada día a la que ha sido mi casa, y seguir aprendiendo (antes como profesores, ahora como compañeros de trabajo) de grandes profesionales… Ahora que, si grandes son como profesionales, tanto o más lo sois como personas… Personas de gran calidad humana… Aprendo tanto de vosotros… Para mí trabajar junto a vosotros es una gozada. Gracias infinitas por vuestro apoyo (os tengo para todo… apenas he comentado algo cuando ya estáis ahí ayudándome) y por todo el cariño que recibo. A mi club Chicas UJA: María (sabes que una persona es buena, buena cuando en dos minutos conectas… a mí me bastó uno cuando te sentaste en la mesa del despacho como compi de despacho para ver tu grandeza como persona… desde el primer minuto conectamos… gracias por aguantarme esos dos años (y espero que dentro de poco sean más), por escucharme cada día con las clases y la investigación… nunca podré agradecerte lo suficiente toda tu comprensión y apoyo… gracias por tu eterna sonrisa y porque, con tu forma de ser y de ver la vida me has transmitido mucha paz); Puri (te admiro… eres una profesional como la copa de un pino… transmites con pasión todo lo que sabes, estudias con tesón cada día para dar lo mejor de ti, eres una grandísima investigadora, conectas con los alumnos… y si alguien necesita algo, sólo pedírtelo y ahí estás… Ojalá tenga la suerte de poder seguir celebrando contigo más éxitos que, sin duda, te llegarán… porque a quien cada día da lo mejor de sí misma, le tiene que llegar lo mejor); Ana (mi Anita… cuántos buenos momentos juntas, cuánto vivido y compartido… cómo echo de menos esos desayunos… lo pasé fatal cuando te fuiste, pero a la vez estaba feliz de ver cómo se te presentaba una gran oportunidad… has peleado mucho por tu tesis… y el día que la defendiste aguanté el tipo tragándome las lágrimas de emoción de ver a mi Ana siendo doctora… eres un ejemplo para mí… nunca te he visto perder la sonrisa por mal que pudieran ir las cosas… y esa sonrisa me ha ayudado en muchos momentos para tirar hacia adelante… Sigue siendo muy feliz porque esa felicidad también me alegra la vida); Elisa (ya nos conocíamos de la carrera… esas tardes de prácticas con los dulces de mi abuela… Juntas nos ayudamos a superar ese primer obstáculo que era el Excel… y lo vencimos… desde ahí, nos pongan lo que nos pongan lo superaremos… sé que ya mismo vas a estar tú también con las mariposillas de depositar tesis doctoral… y lo vas a lograr… cuantas más piedras nos pongan, más alto y fuerte haremos nuestro castillo… no nos está siendo fácil la tesis… pero, al igual que empezamos superando juntas la dirección financiera, vamos a superar juntas este paso para ser doctoras… Ánimo, ya nos queda poco, y vamos a llegar a nuestra meta… sólo tenemos que seguir luchando…); Carla (he tenido la suerte de descubrir en cada una de nuestras quedadas UJA lo grandísima persona que eres… siempre sabes encontrar la palabra que necesito oír, y dicha con esa gran sonrisa… día a día aprendo de tus ganas de emprender nuevos proyectos, tus ideas, tu entusiasmo… Gracias por ayudarme en todo desde el primer minuto y por estar siempre ahí a cada cosa que necesito); y Paqui (qué alegría me dio cuando entraste en la UJA… Te había coordinado el Erasmus y ya vi a una chica trabajadora y llena de ilusión… y poco después, me diste la gran noticia de que te quedabas con nosotros… Hace unas semanas me diste la gran alegría de que te habían dado la FPU… Si es que todo llega… y esto no es más que la justa recompensa a tu esfuerzo… Cuánto nos queda por celebrar juntas… espero que dentro de cuatro añitos te vea siendo doctora… Ánimo y a por esa tesis que ahora comienzas). Quiero dedicar también esta tesis a todos mis chicos doctorandos: María C, Cristina O, Alberto, Leticia, Tina y Teresa… Vamos, que se puede, que vais a llegar y ya mismo… Estamos juntos en esto… sabemos lo que cuesta pero la gran alegría de ver crecer nuestra tesis y culminar nuestra formación. Constancia e ilusión, y en breve todos doctores. Muchas gracias también a Macario Cámara, porque cada día estás atento a cómo estoy, me ayudas con todo lo que necesito, me informas de todo, me empujas para que todo vaya como mejor me favorezca, me aconsejas y tienes siempre una palabra de apoyo… siempre ayudando sin darte el enorme mérito que tienes… jamás podré agradecerte tanto como has hecho y haces cada día por mí. A Antonio Moreno, por su inmensa humanidad, por estar pendiente de todo, por saber cuándo no estamos bien y encontrar las mejores palabras de ánimo, por dar ejemplo vivo de la palabra bondad a quienes nos cruzamos en su camino… la sencillez engrandece a la persona… y a ti te hace grande… muchísimas gracias por tu apoyo y empuje que cada día me hacen tirar para adelante. Un gracias muy especial a mis compañeras Elia García, Rocío Martínez, Paqui Castilla y Mari Paz Horno… Sois para mí como mis madres en la UJA… Siempre aconsejando, escuchándome, dándome todo el apoyo y cariño, con esa sonrisa… de verdad, no hay con qué agradeceros tanto cariño… gracias de corazón. A Jorge Ruiz, gracias por estar disponible para todo y ayudarme siempre con esa amabilidad y esa sonrisa, con esos ánimos y buenos deseos, con tus sabios consejos… tienes un alma grande… y eso lo transmites en tus palabras y en tu forma de ser… gracias por tu ayuda infinita cada día. A Manuel Carlos Vallejo, por esas ganas de que pronto saquemos la fumata blanca… siempre apoyándome y pendiente de cómo voy… gracias por tus ánimos y tu apoyo en todo. A Alonso Moreno, que desde lo callado estás siempre ayudándome… has estado pendiente incluso cuando estuve en Bristol de estancia de cómo estaba… más de una vez me he podido desahogar contigo de cómo iban las cosas, de las revistas y los cambios normativos, del agobio de la tesis… y me siento escuchada… a veces lo más difícil es justamente escuchar… y tú lo logras y con maestría. A mi compi de despacho, Chelo, por ser un grandísimo apoyo cada día y estar siempre pendiente de todo, animándome y transmitiéndome toda su experiencia. Muchas gracias. A todos vosotros, mi segunda familia… no podría quereros más.

Y termino este apartado con dos personas a las que admiro y que, aunque ya no están en la UJA, están ahora cumpliendo sueños en otros destinos. Carmen Cámara, qué decir de ti… si es que diga lo que diga me quedaría corta… eres la bondad hecha persona. Desde que te conocí siempre me has dedicado tu sonrisa, que tanta fuerza me he dado cuando la necesitaba… Me has dado los mejores consejos y con tu ejemplo he aprendido el valor de la perseverancia y de trabajar con ganas para lograrlo. Me has enseñado que esa felicidad que desprendes se logra haciendo felices a los demás. Eres grande como profesional (no me extraña que allí no quieran que te vuelvas… si es que vales mucho y por eso te llegó esta oportunidad…), pero es que más grande aún eres

como persona con todos, y eso es, sin duda, lo más importante en la vida… te has ganado muchos premios académicos, pero el mejor es el agradecimiento de todos los que te conocemos… Mil gracias por todo. Y Cristina Martínez, un gran referente para mí… Investigadora nata, con gran intuición y una capacidad inigualable de trabajo para hacer que este mundo sea un poquito mejor. Muchas gracias por tus consejos en todo este tiempo… Gracias a ti he aprendido mucho y me he sentido totalmente escuchada siempre que lo he necesitado. Gracias por esa humildad que tan grandísima te hace.

En esta trayectoria he podido también trabajar codo a codo con grandes investigadores durante mis dos estancias de investigación. Gracias a mis compañeros en la Universidad Carlos III de Madrid, en el campus de Getafe. Me acogisteis como a una más desde que llegué, integrándome en todas las actividades del departamento. Es ejemplar la calidad profesional y humana de todo el equipo. Gracias a Manuel Núñez por coordinar allí mi labor de investigación y enseñarme con toda paciencia tantas cosas en esa, más que difícil, primera etapa de la tesis. Gracias por estar pendiente de todo… Muchas gracias a Juan Manuel García por sus consejos para orientarme en cómo enfocar mi investigación y compartir conmigo su gran experiencia sobre el campo del conservadurismo. Gracias a Beatriz García por su gran ayuda orientándome sobre investigación, sobre dimensiones de la calidad contable, sobre consejos para escribir mejor… pero sobre todo, por interesarse personalmente en cómo llevaba la tesis… gracias porque no ha hecho falta más que preguntar cualquier cosa para recibir material de apoyo y consejo al respecto. Y un agradecimiento muy especial a Juana Aledo… Desde que entré en aquel despacho vecino, con todo lo que suponía estar lejos de casa y de los míos más tiempo, estar en otra tierra y ser mi primera experiencia de trabajo investigando fuera de la UJA… Tú supiste transmitirme todo ese apoyo que tanto necesitaba… Has sido para mí una segunda madre… pendiente de cómo me sentía, si necesitaba algo, cómo iba mi investigación, qué tal en la residencia… En definitiva, de hacerme sentir como en casa cada día con tu visitilla a mi despacho. Gracias infinitas… Y a todos los compañeros del Departamento de Economía de la Empresa y Contabilidad.

Thank you to all my colleges at the University of Bristol, a fantastic place where I had the chance of improving my research and extending my knowledge thanks to the conversations with such a marvellous teamwork. My special acknowledgement to Mark Clatworthy, the headmaster of the Department of Finance and Accounting of the University of Bristol in 2017, who was in charge of coordinating my research work there. Thank you very much, Mark, because you helped me a lot with all your comments about my suggestions. You were carefully hearing my ideas about the PhD project, asking me about them and telling me more challenging ideas. Moreover, you always were asking me about my stay, whether I was feeling comfortable or needed anything. I am also really thankful for the help of Mariano Scapin during my stay at Bristol, helping me with all of the contact details as well as taking care that everything was nice during my stay at the University of Bristol. Thank you very much, also, to all the members of the Department of Finance and Accounting for giving me the chance of presenting an external research seminar at the University of Bristol (24/05/2017) and receiving such a good feedback for my research project. For me it was an incredible moment having the opportunity of telling my ideas of research to such an acknowledged professionals in the field of Finance and Accounting. Thanks to the ideas that all of the attendants to my seminar gave me I had the motivation to develop the methodological chapter for this doctoral thesis, which is now a paper in revision. Thank you very much to all of you. It was a pleasure for me to share with you three months working and researching in your teamwork.

Quiero agradecer también de manera especial a José Luís Roldán por sus siempre estupendos consejos y sugerencias sobre este mundo del PLS que he tenido la suerte de poder descubrir a lo largo de la realización de la tesis. Muchas gracias por responder siempre atento y rápido a todas las dudas que me surgían… Y no sólo eso, sino además acordarte siempre y mandarme todas aquellas novedades interesantes sobre PLS relacionadas con el tema de investigación. Gracias por todo tu apoyo… Me has ayudado y mucho con esta tesis.

La vida no sería igual sin los amigos… y yo tengo la suerte de tener por amigos a personas maravillosas.

Este mundo investigador me ha dado a conocer un grupo de amigos estupendos gracias a los congresos. Gracias a Cinthia Valle porque desde esa cena en el lagar de Bilbao te has convertido en una auténtica hermana para mí. Desde entonces hemos compartido tantos momentos… ¡Y los que nos quedan! Eres una gran investigadora y tienes además un corazón enorme. Qué ilusión me hizo verte ya doctora… No paras de emprender proyectos y gracias a eso estás creciendo mucho como profesional. Eres todo un ejemplo para mí, y ya sabes que tenemos pendiente un paper juntas… Vera, si es que eres todo corazón… tu sonrisa anima a todo el mundo… Sabes ser sencilla y desde ahí das grandes lecciones de vida. Gracias por darme todo tu apoyo desde que nos conocimos en Bilbao (desde luego, en ese congreso el mejor regalo fue conoceros a todos…). Nora Muñoz, nos conocíamos desde esa primera experiencia con el aterrador Stata… Sobrevivimos ambas, y no perdimos contacto hasta hoy. Lo paso genial contigo porque muchas veces es esa sensación de saber que, sin decirnos nada, estamos pensando en lo mismo… Gracias por tantas risas juntas, por compartir experiencias investigadoras y por todo tu apoyo. Mis "mellis" Luís y Rubén… esto es conocer a las buenas personas por partida doble… Recuerdo ese congreso de Bilbao cuando nos conocimos en la cena en la Bilbaína… Pensé yo, qué simpáticos parecen… y poco a poco he visto que ambos tenéis una enorme humanidad, que estáis siempre dispuestos a ayudar a quien lo necesite, que sabéis escuchar y aconsejar… Y sois geniales investigadores, cada uno en vuestra área, y estoy deseando de seguir celebrando éxitos. Y por supuesto, Luís, pendiente está también ese paper en conjunto. Muchas gracias porque juntos compartimos investigación y buenas experiencias, sonrisas y lágrimas, cabreos y alegrías… gracias por todo, y que sigan los buenos momentos. Mi agradecimiento también a David Huget, Rafaelle, Franciso, Bianca Beyer, Mercedes Luque, Cristina Grande, Nicolás García y Elvira Scarlatt por los momentos compartidos y su apoyo.

Muchas gracias a mis amigos del club de las cenas… Alicia, Marta, Elisa, Melody, Antonio, Nono, José, José Antonio, David, Gema, Rosa y Francisco…

Vosotros me dais toda la energía que necesito… Estáis para las duras y las maduras… Habéis vivido cada momento desde el inicio de la tesis prácticamente, me habéis "sufrido", me dais apoyo, vivimos tantos momentazos juntos… A veces la vida por casualidad te regala encontrarte con muchas buenas personas… y yo fui la afortunada que recibió ese regalo… Muchísimas gracias por estar, para todo y siempre. Nos queda mucho que seguir celebrando… Y dentro de mi club cenas, hay especialmente dos personas que son para mí hermanas… Alicia y Marta… somos el trío lalala… No tendría palabras para agradeceros tanto… conocéis cada detalle de mi alma, nos miramos y sabemos qué sentimos, reímos y lloramos juntas, compartimos pasión por la zumba, disfrutamos grandes momentos… y el remate fue ya que me hicierais el gran regalo de venir a Bristol estando de estancia… Eso no lo olvidaré nunca… Cuando ya fallaban fuerzas para acabar las últimas semanas de estancia, vuestra visita fue todo un chute de energía para mí… Por más tardes de Victotia's Secret, de cafés y de risas… Gracias a mis dos hermanas.

De los buenos vecinos, haces grandes amigos… No podría separar esa fuerza para acabar con esta tesis del grandísimo apoyo de mi vecina, Patricia… Nos unió la pasión zumbera, y desde entonces hemos compartido muchísimos momentos. Muchas gracias, Patri, por aguantar a este "tostonazo" cada día, por escucharme siempre, por hacerme reír cuando más lo necesito, por esos ratos locos de zumba, por esas caminatas… Sabes que de verdad eres amiga de una persona cuando una mirada es suficiente para saber todo lo que se está pensando… Y creo que tú y yo nos entendemos a la perfección sin decir ni media palabra. Esta tesis, por supuesto, va dedicada a ti (sé que dentro de poco me vas a dar muchas alegrías, y seguiremos celebrando éxitos de las dos). Gracias por todo.

Lo que la universidad ha unido, que no lo separe nadie… Estudiando en la Universidad de Jaén tuve la gran suerte de dar con quienes hoy son para mí toda una familia. Empecé conociendo a Fátima, Lucía, Ana y María… Un añito mayores… Fueron como mis hermanas mayores en la universidad. Me ayudasteis en todo momento pasándome apuntes, explicándome ejercicios, contándome cómo se evaluaban las asignaturas… Pero la cosa no quedaba en la universidad. Poco a poco fuimos haciendo piña, y me acogisteis de pleno en vuestro grupo. Y así conocí también a Ana y Jesús, Elena, Vero y Víctor. No puedo tener más suerte en la vida, que me ha ido poniendo en mi camino grandísimas personas… Vosotros lo sois los nueve… Me siento entre vosotros como en casa, disfruto cada momento. Cuántas tardes de risas en la piscina, en nuestros cafés (/cenas /lo que surja mientras sigamos pasándolo genial…). Habéis vivido conmigo cada momento de mi carrera, de mis inicios laborales, de mi tesina… y de mi tesis, hasta ahora. No tendría palabras para agradeceros el enorme apoyo que me dais y lo feliz que me hacéis sentir cada momento que estoy con vosotros. Quien tiene un amigo, tiene un tesoro… Y si tienes un grupo de amigos así, desde luego, tienes el mejor legado que podrías recibir jamás. Os quiero y mucho, lo sabéis… Gracias por tanto… Va por vosotros esta tesis.

La universidad también me regaló conocer a mi casi hermana… Marta Pérez. Somos como dos gotas de agua, pensamos lo mismo y a la vez, compartimos forma de ver la vida, de creer, de sentir… Hemos compartido tantos buenos momentos… Hemos reído y llorado juntas… Sé que siempre te tendré como amiga y hermana, al igual que sabes que tú me tendrás a mí. Mil gracias por todo, hermanita…

Y muchas gracias, cómo no, a mi familia zumbera… Si cojo fuerzas cada día es gracias a los buenos momentos que pasamos. De verdad, no tiene precio entrar al gimnasio, recibir tanto cariño, compartir nuestra pasión por el baile, vibrar con cada nota, reír cuando nos cambian las canciones y vamos cada cual para un sitio… Es una gozada formar parte de mi familia ZZ. ¡Os debo muchísimo y el cariño que os tengo es enorme! Gracias de corazón. Un gracias aquí muy especial a mi Chipirona, Laura M, por haber sido mi hombro de risas, lágrimas, alegrías, enfados… pero sobre todo, de olvidarlo todo bailando. Gracias por tantísimos buenos momentos.

Gracias a los monitores de La Victoria porque con vosotros he ganado no sólo en salud y calidad de vida, sino también en felicidad, y eso me ayuda y mucho a todo lo que hago… Yo no quería apuntarme al gimnasio, me negaba a moverme… Hasta que gracias a vosotros he aprendido a ver en el deporte una pasión que me activa y me hace estar realmente feliz. Me habéis ayudado también a coger mucha más confianza en mí misma, a demostrarme que poco a poco y con esfuerzo se logran las cosas por difíciles que parezcan (quien me diga a mí que consigo hacer los equilibrios en BodyBalance, coordinarme bailando, mover la cadera en danza del vientre… cuando antes era un palo rígido, descoordinado y que se caía en lo más llano…). De verdad, me habéis cambiado totalmente y me habéis ayudado a ver siempre un "*vamos, a por ello*" en lugar de un "*eso, ni en broma lo logro*"… Laura, Carmen, Esther, María F., María O., Alexis, Miguel… Un enorme gracias por lo que cada día me hacéis sentir. Que siga el ritmo, que siga la diversión, que siga el esfuerzo para lograrlo… Ya sabéis mi lema… "*¡Vamos, vamos, vamos!*". Muchísimas gracias también a mis niños de limpieza y de recepción de La Victoria por su apoyo infinito, por esas sonrisas que me dedican cada día cuando entro, por ser magníficos profesionales y, si cabe, mejores aún personas. Gracias porque con vosotros, desde vuestro ejemplo, desde vuestra sencillez, desde vuestro saber hacer y saber escuchar, me dais las mejores lecciones de vida… La grandeza de corazón se gana en el trato día a día con las personas… Y eso es algo que lleváis a gala… Luisi, Luisa, Belén, Antonio, Loli, Jesús, Marisol, Laura y Mari Paz… ¡Sois geniales!

Y si de verdad empecé a tirar para adelante con el deporte, con la tesis y demás en un momento en que todo lo veía muy complicado (en especial ese primer bache de tesis) fue gracias a Alice… Empecé a amar el deporte gracias a tus clases de zumba (conste que antes no quería seguir en el gimnasio más que el mes que estaba ya pagado… pero cambié de opinión tras la primera clase de zumba contigo…). Me has impulsado muchísimo, me has ayudado a crecer como persona… Eres todo un ejemplo para mí de fortaleza, de sacar sonrisa aunque por dentro estés rota, de ponerle alegría a la vida, de tener ilusiones y sueños y no cansarte jamás de luchar hasta conseguirlos, de simpatía con todos, y de un saber estar que no muchas personas tienen… Gracias por hacerme ver lo bueno que había en mí, por escucharme siempre y por saber darme el mejor consejo justo en el momento en que necesitaba oírlo… Nunca olvidaré esa conversación cuando te dije que veía muy negro todo lo de la tesis (y al principio prácticamente que estaba…), y me dijiste que investigar es dar lo mejor que tienes, lo que de verdad te gusta, en lo que eres buena, y ponerlo al servicio de la sociedad para hacerla avanzar… No se puede dar mejor idea de investigación… Tú lograste también culminar tu investigación, y me decías que fue una etapa feliz en tu vida… Desde aquel día siempre he tenido en mente (a veces no he llegado a lograrlo, pero siempre lo tengo presente) esa frase de "*ama lo que haces, disfruta de tu tesis, disfruta de tu vida*". Eres un gran ejemplo y sé que vas a seguir triunfando sea donde sea. Gracias, Ali, por todo lo que me transmites.

Y me he reservado para el final una persona que no está, pero que a la vez está muy presente siempre en mi vida… Mi abuelo Pepe. Abuelo, desde pequeña me has dejado el mejor legado que hubieses podido pensar… me has enseñado un valor que hoy por hoy es la base y el empuje en todo lo que hago. Desde que era niña, me decías: "*Ana, ten siempre valor propio*"… Valor propio… Cuánto dicen esas dos palabras… Así tal cual, yo no entendía muy bien lo que era… Pero tú me ayudaste no sólo a entenderlo, sino a verlo en ti y vivirlo en lo que hacía… Me mirabas la ortografía y querías que estuviera siempre perfecto (cuánto te debo… cuánta huella has dejado en mí… qué cerca te siento…). Aprendí a confiar en mí misma, a ver en mí ese valor para hacer las cosas con rigor para hacerlas bien, a no rendirme jamás (con el deporte, que tanto me costaba… siempre me ayudaste a no rendirme). Tú también has sido un luchador, hasta el final… Partido a partido (como tu Atleti), has ganado batallas. Hoy, por supuesto, me encantaría abrazarte… Pero sé que estás con la mejor compañía, y que estarás hoy gozando desde allí compartiendo la felicidad de ver a tu nieta ya doctora, avanzando en la educación, que tan importante has considerado siempre. El día de mi comunión me escribiste una dedicatoria preciosa: "*Me diste la primera gran alegría cuando naciste y te bautizaste, hoy me has dado la segunda gran alegría en tu primera comunión… Espero que me des la tercera gran alegría cuando te cases*"… No sé si me casaré, abuelo, pero sé que para ti hoy esta tesis a va a ser tu tercera gran alegría. Por eso, a ti muy en especial te dedico esta tesis. Siempre has estado orgulloso de mí, y espero que esta tesis también te siga haciendo sentir así. Cada vez que he estado por rendirme, he tirado para adelante por darte esa tercera alegría. Gracias por acompañarme día a día y cuidar de mí desde donde estás, desde lo más alto. Va por ti abuelo. Te quiero infinito. Gracias por tanto…

CHAPTER 1

Introduction

CHAPTER 1. INTRODUCTION

1.1 MOTIVATION OF RESEARCH.

Earnings quality is one of the most common topics in accounting literature. Notwithstanding this, the fact that earnings quality is a non-directly observable concept makes its measurement difficult. The adoption of an adequate technique for earnings quality measurement, given the importance of this topic in literature, is crucial, because the validity of the conclusions got in empirical studies of consequences or determinants of earnings quality would be affected.

The present doctoral research dissertation presents an in-depth revision of earnings quality measurement, analysing the current state of research and offering new insights on recent techniques that may be more adequate, given the characteristics of earnings quality.

We contribute to prior literature from a theoretical point of view with a detailed analysis of the state of the art on earnings quality measurement from a multidimensional point of view. This review reveals that there is a consensus about the multidimensional nature of earnings quality, as there are several dimensions that are indicative of earnings quality, none of them being superior to the others nor enough to completely represent it (see for example Dechow, Ge, & Schrand, 2010; Dechow & Schrand, 2004; Francis, LaFond, Olsson, & Schipper, 2004; Francis & Schipper, 1999; Perotti & Wagenhofer, 2014). Such theoretical consensus, however, is not reflected on empirical works that aim to measure earnings quality, for most models analyse a single dimension of earnings quality, thereby adopting a unidimensional scope.

To bridge this gap between the theoretical concept of earnings quality and its empirical measures, we revise the framework for theory-based empirical research in Social Sciences, applying that framework to the measurement of earnings quality. Thus, by revising the conceptualization of earnings quality, we found some concerns. First of all, we observe that there is not a clear, unique, explicit concept of earnings quality neither in accounting legislation nor in prior literature. This way, literature talks about earnings quality in terms of a list of properties indicative of greater usefulness of accounting information for different outcomes of decision making (Dechow et al., 2010; Perotti & Wagenhofer, 2014) such as economic income (Schipper & Vincent, 2003), actual performance (Dechow & Schrand, 2004; Demerjian, Lewis, Lev, & McVay, 2013) or market efficiency (Ewert & Wagenhofer, 2011; Fields, Lys, & Vincent, 2001). Secondly, although the literature on this issue recognizes that there are various dimensions related to earnings quality, the relationships of those dimensions among them or with the earnings quality construct are not clear. Thirdly, there are several empirical proxies to represent each dimensions but a lack of theoretical analysis on the validity of each of them, their ability to accurately represent the concept is under question (Perotti & Wagenhofer, 2014), and different studies have rendered contradictory results for proxies representing the same concept (Ewert & Wagenhofer, 2011). Fourthly, models previously used in prior literature to measure earnings quality (both uni- and multidimensional ones) have been shown to be non-satisfactory because of misspecification or bias in estimation for correlated omitted variables. Incorrect specification has important implications also from an empirical point of view because results from the analysis of earnings quality with other variables would reflect inaccurate conclusions (W. Chang, Franke, & Lee, 2016; Jarvis, MacKenzie, & Podsakoff, 2003; MacKenzie, Podsakoff, & Jarvis, 2005). Finally, we conclude that the use of more sophisticated techniques for earnings quality measurement is demanded, because first-generation ones (in particular, Ordinary Least Squares (OLS) regression) are not able to model complex relationships between different variables at the same time (Gefen, Rigdon, & Straub, 2011; Lee, Petter, Fayard, & Robinson, 2011; Nitzl, 2016; Smith & Langfield-Smith, 2004). In short, empirical research can benefit from more rigorous estimation techniques for earnings quality measurement that accurately represent the concept and allow the extraction of valid conclusions from the analysis with other variables for future research.

With the aim of improving earnings quality measurement, we carry out an empirical study that adopts second-generation regression models (in particular, Partial Least Squares –PLS–) for earnings quality measurement. The originality of our research focus on the methodology used to assess the validity of earnings quality measurement. PLS has been widely adopted for other disciplines in Social Sciences such as Management Accounting, Psychology, Strategic Management, Management Information Systems, or Marketing (Hair, Ringle, & Sarstedt, 2011, 2013; Lee et al., 2011; Sarstedt, Ringle, & Hair, 2014). These disciplines have taken advantage of the ability of PLS to empirically represent non-directly observable variables (latent variables) with several empirical proxies (indicators), incorporating as many proxies as needed with an appropriate weight for each of them according to their importance to explain the concept (Hair, Sarstedt, Pieper, & Ringle, 2012; Henseler, Ringle, & Sinkovics, 2009; Lee et al., 2011; Nitzl, 2016; Smith & Langfield-Smith, 2004). Additionally, PLS is used in Social Sciences as a method to rigorously validate measurement proxies for any theoretical concept (Hair et al., 2012; Henseler, Ringle, & Sarstedt, 2012; Nitzl, 2016). For that reason, we make a contribution to prior literature from an empirical point of view by proposing and empirically testing a model for earnings quality measurement that includes main proxies used in literature. Following the scale validation process (Diamantopoulos & Winklhofer, 2001) we systematically evaluate the validity of earnings quality measurement. Moreover, we provide evidence of the superiority of PLS over those estimation models previously used in terms of a greater predictive power both in sample and out of sample and a reduction of estimation bias. The importance of our empirical study is that it allows for a more precise estimation of earnings quality, including all proxies that appropriately represent the dimension of earnings quality they measure and explicitly considering the inter-relation among those dimensions. Furthermore, this model estimates the optimal weight for each proxy and dimension according to the importance to explain earnings quality.

In short, this doctoral research study analyses the complexity of earnings quality measurement, highlighting the main problems of previous models in prior literature and proposing a new methodology for its estimation. The application of such methodology may help to overcome those problems, allowing for a less biased and more powerful estimation of earnings quality, considering all its representative dimensions. Furthermore, the validity of the proxies included in the model is assured after having analysed such validity with a rigorous, systematic process. This has implications for both researchers and practitioners. For researchers, it questions the validity of conclusions got from previous analysis with less accurate models of earnings quality measurement and opens a new possibility to obtain more valid ones. Additionally, it helps to identify those key dimensions that are more important for the decision making processes of the different stakeholders, as well as those other dimensions that are less relevant. For practitioners, the greater accuracy in earnings quality estimation can help them to orientate their accounting choices to influence those dimensions that have a stronger impact on the stakeholders' decisions. Thus, for instance, regulators can identify the possible interaction among the different earnings quality dimensions, being able to study how the standards that are aimed to affect some dimensions can have secondary effects on other ones. Additionally, the supervisors of the quality of financial statements (audit firms, supervisor authorities…) can also benefit from a multidimensional analysis of earnings quality, for their conclusions would be really accounting for a variety of facts determining earnings quality, all of them assessed to be valid and accurate to represent it.

1.2 OBJECTIVES OF RESEARCH.

The main objective of this doctoral research is to analyse earnings quality measurement from a multidimensional point of view, proposing a solution to models previously used in prior literature. This solution consists of the application of structural equation models as second-generation regression methods, in particular Partial Least Squares (PLS), as a holistic model that allows for a multidimensional approach for earnings quality estimation. This is an estimation technique that, despite being widely used in other disciplines of Social Sciences, it has not been widely used in financial accounting research. We will also use the application of this method to rigorous, systematically assess the validity of the main empirical proxies used in prior literature.

More in details, we can summarize the specific objectives of our research as follows:

1-) Analysis of the state of the research on earnings quality. With this objective we aim to:

-Undertake a literature review on the earnings quality studies in those accounting journals included in the Journal of Citation Report, identifying the main proxies used in prior literature to represent empirically earnings quality, as well as those models and statistical techniques that have been adopted.

-Carry out a critical review of these earnings quality measures, highlighting its problems and the models and statistical techniques that have been used for their estimation.

2-) Analysis of the validity of earnings quality conceptualization. With this objective we aim to:

-Study the different definitions of the earnings quality concept that have been used both in accounting standards and in the extant literature.

-Analyse whether the ways in which researchers have empirically measure the variable "earnings quality" are appropriate and consistent with the definition of the term.

-Test the validity of conceptualization (both at the conceptual and operational level) of the main models previously used for earnings quality measurement, comparing their estimation errors.

-Propose an appropriate method for earnings quality measurement and empirically validate its superiority over previous models, as compared with models previously used, with a simulation analysis.

3-) Empirical validation of the proposed method for measuring earnings quality, using archival data from the financial statements of a sample of firms. With this objective we aim to:

-Revise the adequacy of the different earnings quality proxies that have been previously used in accounting research to accurately represent the theoretical concept they are intended to measure, indicating those cases in which there is not a correspondence between the empirical indicator and the dimension latent variable.

-Analyse the internal consistency of the different measures for each dimension, assessing if those measures refer to the same or to different concepts, and if that concept is explained correctly by those measures.

-Offer empirical evidence of the boundaries of those techniques that have been previously used for measuring earnings quality, as opposed to more sophisticated statistical methods that approach earnings quality measurement with a multidimensional scope.

4-) Development of a methodology for defining a multi-dimensional measure of earnings quality. With this objective we aim to:

-Develop a multi-dimensional measurement method that includes the different facets of earnings quality, controlling for the potential correlation between them and allowing for the inclusion of different measures (proxies) for each of these dimensions.

-Compare the predictive capacity of traditional models of earnings quality measurement as opposed to our new proposed model, checking if, as expected, the new model increases the predictive estimation power reducing estimation bias.

1.3 STRUCTURE OF THE DOCTORAL RESEARCH STUDY.

The present doctoral research study is structured as follows.

Chapter 2 presents a review of the research on earnings quality measurement, specially focusing on its multidimensional nature. This chapter describes the process of the bibliometric review, classifying the different studies according to which specific dimension of earnings quality is analysed. We then describe the different properties that are indicative of earnings quality, as well as the empirical indicators that previous papers have used to represent those properties. Later, we study the different methods followed by the researchers to measure earnings quality from both the unidimensional and the multidimensional points of view, analysing the technique they use and the problems associated to each way of estimating earnings quality.

Chapter 3 justifies and explains the methodology that we propose as a suitable estimation method for earnings quality measurement. We start this chapter with a description of the conceptualization process to empirically represent any non-directly observable variable in social sciences. Considering this general process, we revise prior literature on earnings quality measurement, highlighting the main problems that arise from the estimation models previously used. We then propose the application of second-generation regression methods and, in particular, Partial Least Squares (PLS) for measuring multi-dimensional earnings quality and testing the relationship between earnings quality and its causes or consequences. We analyse how this method has been used in Social Sciences and justify its appropriateness for measuring earnings quality, discussing how this method helps to overcome the problems evidenced in prior models. To reinforce this justification, we undertake a simulation process that provides evidence of the greater estimation power and lower bias of PLS estimates over those estimates computed using the techniques used in empirical accounting research for measuring multi-dimensional earnings quality.

Chapter 4 presents the empirical results. After presenting the research design for earnings quality measurement using a PLS model as well as the main descriptive statistics for the indicators included in the model, we discuss the scale validation process with PLS of the main proxies for the different earnings quality dimensions in prior literature (measurement model validation). For the sake of clarity, results are presented for each dimension, analysing the validity of the different indicators in the representation of their theoretical concept. This test of the validity has been done considering both, each indicator individually and the aggregation of all the indicators of the same dimension. We also checked the discriminant validity of each dimension, to assess whether each dimension is significantly distinguishable from the others. After checking the validity of the measurement model, we analyse the strength of the relationships between the different properties of accounting information in terms of their explanatory power (both, in sample and out of sample) on the perceived level of earnings quality perceived by equity investors. Similarly, we analyse whether it makes sense to consider a general, abstract concept of earnings quality or, on the contrary, there are merely a list of dimensions representative of it. Finally we analyse the importance of each dimension to explain earnings quality outcomes (Importance-Performance Map –IPMA– analysis).

The present doctoral thesis ends with Chapter 5, where we present the main conclusions, the limitations of the study, and the future research lines that can be developed.

1.4 REFERENCES FOR CHAPTER 1.

Chang, W., Franke, G. R., & Lee, N. (2016). Comparing reflective and formative measures: New insights from relevant simulations. *Journal of Business Research*, *69*(8), 3177–3185.

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting & Economics*, *50*(2/3), 344–401.

Dechow, P., & Schrand, C. (2004). Earnings quality. *The Research Foundation of CFA Institute*.

Demerjian, P., Lewis, M., Lev, B., & McVay, S. (2013). Managerial ability and earnings quality. *The Accounting Review*, *88*(2), 463–498.

Diamantopoulos, A., & Winklhofer, H. M. (2001). Index Construction with Formative Indicators: An Alternative to Scale Development. *Journal of Marketing Research*, *38*(2), 269–277.

Ewert, R., & Wagenhofer, A. (2011). *Earnings quality metrics and what they measure* (Working Paper). University of Graz.

Fields, T. D., Lys, T. Z., & Vincent, L. (2001). Empirical research on accounting choice. *Journal of Accounting & Economics*, *31*(1–3), 255–307.

Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2004). Costs of Equity and Earnings Attributes. *The Accounting Review*, *79*(4), 967–1010.

Francis, J., & Schipper, K. (1999). Have financial statements lost their relevance? *Journal of Accounting Research*, *37*(2), 319–352.

Gefen, D., Rigdon, E. E., & Straub, D. W. (2011). An Update and Extension to SEM Guidelines for Administrative and Social Science Research. *MIS Quarterly*, *35*(2), iii-A7.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *The Journal of Marketing Theory and Practice*, *19*(2), 139–152.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. *Long Range Planning*, *46*(1–2), 1–12.

Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012). The Use of Partial Least Squares Structural Equation Modeling in Strategic Management Research: A Review of Past Practices and Recommendations for Future Applications. *Long Range Planning*, *45*(5–6), 320–340.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2012). Using partial least squares path modeling in advertising research: basic concepts and recent issues. In S. Okazaki (Ed.), *Handbook of Research on International Advertising* (pp. 252–276). Cheltenham, UK: Edward Elgar.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares structural equation modeling in marketing research. *Advances in International Marketing*, *20*, 277–320.

Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research*, *30*(2), 199–218.

Lee, L., Petter, S., Fayard, D., & Robinson, S. (2011). On the use of partial least squares path modeling in accounting research. *International Journal of Accounting Information Systems*, *12*(4), 305–328.

MacKenzie, S. B., Podsakoff, P. M., & Jarvis, C. B. (2005). The problem of measurement model misspecification in behavioral and organizational research and some recommended solutions. *Journal of Applied Psychology*, *90*(4), 710–730.

Nitzl, C. (2016). The use of partial least squares structural equation modelling (PLS-SEM) in management accounting research: Directions for future theory development. *Journal of Accounting Literature*, *37*, 19–35.

Perotti, P., & Wagenhofer, A. (2014). Earnings quality measures and excess returns. *Journal of Business Finance & Accounting*, *41*(5–6), 545–571.

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2014). PLS-SEM: Looking Back and Moving Forward. *Long Range Planning*, *47*(3), 132–137.

Schipper, K., & Vincent, L. (2003). Earnings quality. *Accounting Horizons*, *17*, 97–110.

Smith, D., & Langfield-Smith, K. (2004). Structural Equation Modeling in Management Accounting Research: Critical Analysis and Opportunities. *Journal of Accounting Literature*, *23*, 49–86.

CHAPTER 2

Theoretical framework. A review on the multidimensional analysis of earnings quality

CHAPTER 2. THEORETICAL FRAMEWORK. A REVIEW ON THE MULTIDIMENSIONAL ANALYSIS OF EARNINGS QUALITY

2.0. INTRODUCTION TO CHAPTER 2.

Earnings quality is one of the most common topics in empirical research on financial accounting, as evidenced by the many research reviews (Dechow, 1994; Dechow & Skinner, 2000; Demerjian et al., 2013; Ecker, Francis, Kim, Olsson, & Schipper, 2006; Fields et al., 2001; García Osma, Gill de Albornoz Noguer, & Gisbert, 2005; Healy & Wahlen, 1999; Hermanns, 2006; Imhoff, 2003; McNichols, 2000; Nelson, Elliot, & Tarpley, 2003; Penman, 2003; Schipper & Vincent, 2003). As earnings quality is not directly observable, empirical researchers have typically measured it using a variety of empirical proxies that are expected to be associated with any desirable property of accounting information as, for example, persistence, smoothing, or accruals quality (Perotti & Wagenhofer, 2014). As none of these measures has emerged as superior for all decision models (Dechow et al., 2010), earnings quality can be considered a multidimensional concept.

This chapter presents a review of the literature on earnings quality, focusing on its multidimensional nature. The study reveals that, despite the theoretical consensus about this multidimensional nature, the vast majority of empirical works on earnings quality do not take into account the multidimensionality of the concept, thereby analysing just one characteristic of earnings. Moreover, although some studies consider various proxies of earnings quality, the analysis of these proxies is done in separate models, without taking into account the possible inter-relationships among the different proxies. Furthermore, research on the relationships among various earnings-quality dimensions is scant, and conclusions are, so far, mixed. Finally, a few researchers have tried to develop a multidimensional measure of earnings either by defining additive indices or using factor analysis of several earnings properties. These naïve multidimensional measures present their own problems, including lack of control for complementarity or substitution effects among different properties, the use of equal weights for all properties (Leuz & Wysocki, 2016), or the fact that not all earnings-quality dimensions enter into the definition of those indices.

This chapter is structured as follows. Section 2.1 describes the bibliometric review. Section 2.2 presents various dimensions of earnings quality and analyses empirical proxies commonly used in prior literature to measure them. Section 2.3 presents an analysis of two groups of papers on earnings quality: Sub-section 2.3.1 contains a review of the empirical research analysing earnings quality unidimensionally (defined as using just one dimension) and research with multidimensional analyses of earnings quality, but in separate models, ignoring the relationship among those dimensions. It is demonstrated that, analytically, measuring a multidimensional construct such as earnings quality using just one of its dimensions can produce biased estimations because of correlated omitted variables or endogeneity problems. Sub-section 2.3.2 presents an analysis of papers addressing earnings quality multidimensionally and contains two types of studies: papers analysing the inter-relationships among various dimensions of earnings quality, and papers using additive indices as composite measures of earnings quality. Section 2.3 also presents an analysis of the limitations of indices representing earnings quality, concluding that they can yield biased estimates because of the correlations between properties and because of equal weights. Section 2.4 highlights the necessity of developing multidimensional measures of that concept to avoid these problems. The use of other estimation techniques, such as Structural Equation Modelling would enable a composite measure of earnings quality.

2.1 DESCRIPTION OF THE BIBLIOMETRIC REVIEW.

As previously exposed, in this Chapter we aim to undertake a literature review to get a picture about the state of the art in earnings quality measurement. To do so, the following methodology has been adopted. All articles in 18 journals of the *Journal of*

Citation Reports (*JCR*) 2014[1] published between 2000 and 2014 were examined. We included in the review those meeting the following three criteria: (1) The title, abstract, or keywords must reflect earnings-quality content[2]. (2) The article must report on an empirical or methodological study. (3) The article must deal specifically with earnings quality, discarding those that deal with similar topics as audit quality, forecast quality, voluntary disclosure, or quality of management accounting system. According to these criteria, 6214 articles were reviewed.

We found 618 papers that were considered as earnings-quality articles (9.9% of reviewed articles), indicating that earnings quality is arguably one of the most common issues in accounting research. Furthermore, the interest in earnings quality has grown along the period of study; whereas in 2000 we found 13 earnings-quality articles (4.2% of reviewed articles from 2000), in 2014 we located 112 (22.8% of the papers from 2014).

Of the 618 earnings quality papers, 572 (92.6%) were empirical works; the remaining 46 (7.4%) can be considered as methodological papers, as they provide no empirical measure of earnings quality but analyse theoretically different aspects of earnings quality such as the relationships among various properties of accounting information or their determinants or consequences. As the aim of this Chapter is the analysis of multidimensionality in earnings-quality measurement, we focus on the 572 empirical papers.

Because earnings quality is unobservable, empirical researchers typically measure it using a variety of empirical proxies that are expected to be associated with

---

[1] The reviewed journals are *Abacus*, *Accounting and Business Research*, *Accounting and Finance*, *Accounting, Auditing and Accountability Journal*, *Accounting Horizons*, *Accounting, Organizations and Society*, *Accounting Review*, *Asia-Pacific Journal of Accounting and Economics*, *Australian Accounting Review*, *Contemporary Accounting Research*, *European Accounting Review*, *Journal of Accounting and Economics*, *Journal of Accounting and Public Policy*, *Journal of Accounting Research*, *Journal of Business Finance and Accounting*, *Journal of International Financial Management and Accounting*, *Management Accounting Research,* and *Review of Accounting Studies*.

[2] Examples of the expressions we consider that reflect earnings quality content are "earnings quality", "accounting quality", "financial reporting quality", "earnings management", "predictability", "persistence", "smoothing", "conservatism", "earnings response coefficient (ERC)", or "earnings restatements".

desirable properties of accounting information (Perotti & Wagenhofer, 2014). These properties are indicative of earnings quality according to the usefulness of accounting information in a specific decision-making process (Dechow et al., 2010). Consequently, the consensus among accounting researchers is that earnings quality is a multidimensional concept (Dechow et al., 2010; Demerjian et al., 2013; Fields et al., 2001; Francis et al., 2004; Schipper & Vincent, 2003).

Dechow et al. (2010) classify empirical proxies of earnings quality in the following categories: accounting properties of earnings, measures of the investors' response or market response to earnings, and other external indicators of earnings misstatements. *Accounting properties of earnings* comprise four characteristics of reported earnings that are expected to increase in usefulness in the decision-making process: (absence of) earnings management (accruals quality and earnings distribution irregularities), earnings and accruals persistence, earnings smoothness, and conservatism. *Investor or market reactions to reported earnings* are based upon the idea that higher-quality earnings provide useful information for equity valuation (Dechow et al., 2010; Holthausen & Watts, 2001). Consistent with this idea, a higher earnings quality level would be associated to a tighter relationship between accounting and stock market data. The earnings response coefficient (ERC) and the R^2 from the earnings-returns model are the proxies included in this category. *Other external indicators* include SEC enforcement releases, restatements after negative audit opinions, and internal control weaknesses. Independent experts' negative opinions of a firm's financial statements (eventually resulting in restatements or modified audit opinion), or weaknesses in a firm's internal control system can be indicative of poor earnings quality.

Following Dechow et al., we have classified the located earnings quality papers in three groups (market reactions, accounting properties, and other external indicators), as outlined in Figure 1. The vast majority of empirical papers on earnings quality (472/572: 82.5%) measure accounting quality using one or more proxies that can be included in "accounting properties of earnings" category; 81 articles (14.2%) measure earnings quality through market (investors') reaction measures; finally, only 19 (3.3%) use other external indicators. Thus the measures from the "accounting properties of earnings" category are the dominant in the literature. Consequently, we focus our analysis for the remainder of this Chapter on the 472 studies that use any proxy from the "accounting properties of earnings" category.

2.2 EARNINGS PROPERTIES.

In this section, we review the 472 empirical articles that employed any proxy that can be classified in any of the following four accounting properties of earnings: earnings management, earnings smoothing, persistence, and conservatism. Next, we revise the papers for each one of those properties.

2.2.1 Earnings management.

Earnings management can be defined as the disclosure of unreliable financial information to influence stakeholders' decision-making, achieving benefits only for the firm's managers (Dechow & Skinner, 2000; Healy & Wahlen, 1999). Earnings management, therefore, may lead stakeholders to make decisions based on unreliable information, eventually leading to investment inefficiencies (Biddle & Hilary, 2006). Consequently, earnings management is expected to be inversely related to earnings quality because manipulated earnings worsen decision-making process.

Accounting researchers distinguish between accounting-based and real-earnings management. The accounting-based approach analyses how managers manipulate reported accounting numbers to their benefit. Real earnings management consists of manipulating the earnings figure through real investment decisions made by managers, irrespective of accounting (e.g. reducing capital expenditures or discretionary expenses). Consistent with the aim of analysing earnings quality through accounting system quality, the analysis focuses on accounting-based earnings management.

FIGURE 1: DISTRIBUTION OF THE SAMPLE ACCORDING TO THE ANALYZED PROXIES.

NOTE: The number of papers in each category is not equal to the number of papers in the total sample because a single paper may be classified in more than one earnings quality proxy and more than one accounting property, as it may use various earnings quality proxies from different categories.

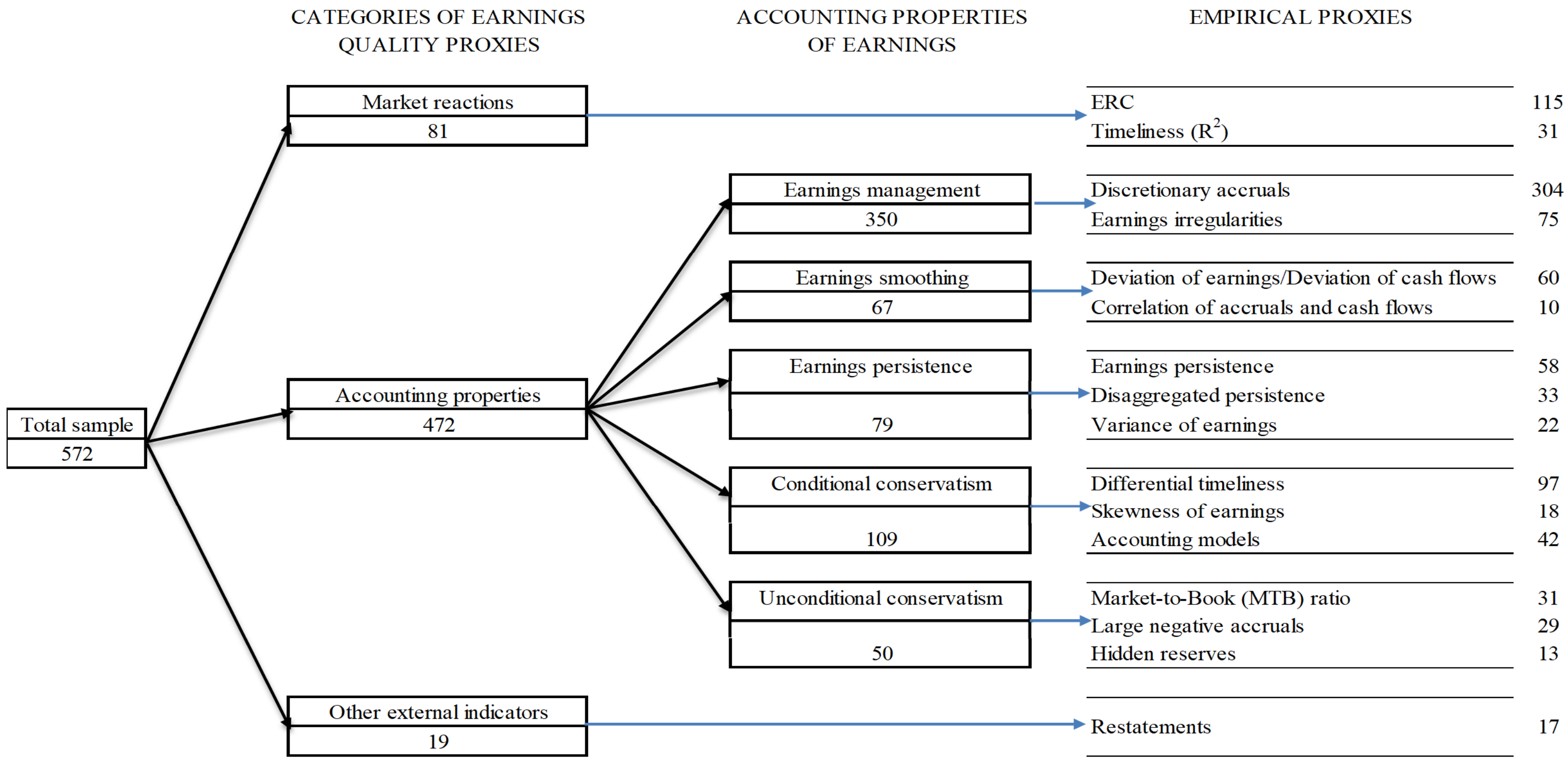


Figure 1 summarizes the number of empirical papers on earnings quality dividing them into three categories: market reactions, accounting properties, and other external indicators. *Category level* includes the number of papers for each category. *Accounting-properties* level details the number of papers that have considered each one of the five accounting properties (earnings management, earnings smoothing, earnings persistence, conditional conservatism and unconditional conservatism). *Proxy level* reports the number of papers using each one of the indicated proxies. The reported numbers of papers include all the works, disregarding their unidimensional (one property/category) or multidimensional (various properties in separate regressions, analysis of correlation, and composite indices) approach.

Empirical research on accounting-based earnings management has followed two main approaches: an estimation of discretionary or abnormal portions of accruals, named as accruals quality, and detection of irregularities in earnings distribution.

Accruals quality estimation.

Researchers investigating discretionary accruals assume that earnings can be manipulated through incomes or expenditures whose cash-flow counterpart is recognized not in the analysed period, but in subsequent periods. The temporal matching of these incomes or expenditures in accounting is recognized using accruals. Total accruals would comprise accruals generated by the company's normal activities (non-discretionary accruals) plus accruals resulting from managers' manipulations (discretionary accruals).

The most commonly used method of assessing earnings management is the estimation of discretionary accruals. This estimation consist on the definition of a prediction model of non-discretionary accruals, being discretionary accruals the difference between actual total accruals and the expected value of non-discretionary accruals according to the estimated model. Other authors, on the other hand, use the amount of total accruals or the analysis of some specific accruals to assess the existence of earnings management.

The validity of the conclusions resulting from the discretionary accruals models depends on the ability of the model to estimate accruals precisely. Despite the generalized use of this approach to estimate discretionary accruals, the 304 empirical studies reviewed show a low estimation power. Particularly in papers that analysed the estimation power of these models, only induced manipulation of a great magnitude (>4–5% in total assets) was detected (Dechow, Sloan, & Sweeney, 1995; Kothari, Leone, & Wasley, 2005). In other studies, discretionary accruals models showed worse results than ingenuous models of average total accruals did (Thomas & Zhang, 2000), and were unable to detect cases of extreme manipulation in firms with earnings restatements

(Jones, Krishnan, & Melendrez, 2008). In short, much empirical evidence questions the validity of these models.

Earnings distribution irregularities.

Studies on earnings distribution irregularities have focused on the few observations with earnings below a certain target (primarily zero earnings, prior-year earnings, and analysts' forecasts) compared to the number of observations just beating that target (Burgstahler & Dichev, 1997; Degeorge, Patel, & Zeckhauser, 1999). This difference (irregularity) in the distribution of the number of observations (representing earnings in the X-axis) may indicate the existence of earnings management. Managers have incentives to meet or beat those earnings targets for several reasons such as the firm's credibility or managers' target-based remuneration. Thus, if managers observe that accounting numbers do not reach the target, they may decide to boost earnings to make them beat the target. For that reason, there will be few observations below the target but many observation beating the target slightly.

The study of earnings irregularities for measuring earnings quality, however, is not problem-free. Some researchers have noted that causes other than earnings management can produce such irregularities, including the effect of the normalization factor (Durtschi & Easton, 2009), or the asymmetry produced by taxes or conservatism policies (Beaver, McNichols, & Nelson, 2007). Because this method can be used to estimate earnings management in a sample of companies, it cannot be used to produce a firm-year-specific measure of earnings quality.

2.2.2 Earnings smoothing.

Beidleman (1973) defined earnings smoothing as the managers' attempts to reduce abnormal earnings variations. The relationship between earnings smoothing and earnings quality is controversial. Low variability of earnings over time can indicate high-quality earnings because smoothed earnings can be forecasted with lower error than can high-variability earnings (Biddle & Hilary, 2006; Burgstahler, Hail, & Leuz, 2006; Schipper & Vincent, 2003). Yet managers can opportunistically smooth earnings through earnings-management practices. Thus, earnings smoothing would proceed from earnings-manipulation practices that introduce noise into accounting information, thereby reducing earnings quality (Schipper & Vincent, 2003). Managers would then be hiding or delaying changes in fundamental performance, which, if revealed, would increase the usefulness of earnings (Dechow et al., 2010). Furthermore, variation in the extent of smoothness is due not merely to variation in fundamental performance, but also to changes in the accounting choice or the ability of accounting systems to capture fundamental performance – even absent managers' decisions (Dechow et al., 2010).

Researchers have used two empirical proxies of earnings smoothing (Dechow et al., 2010). One compares variability in earnings relative to variability of sales or operating cash flow, the aim being to control for variability in a firm's economic performance (Leuz, Nanda, & Wysocki, 2003). A low ratio would indicate that earnings vary less than the proxy for the firm's economic performance variability, indicating smoothed earnings. The second measure correlates total or discretionary accrual changes with changes in cash flows. Although this correlation is expected to be negative, it can be expected to be closer to -1 if managers manipulate accruals to compensate for the firm's variation in economic performance, thereby smoothing earnings (Leuz et al., 2003; Tucker & Zarowin, 2006).

These measures present a significant problem for detecting accounting earnings management, however: They do not discriminate between earnings-smoothing consequences of earnings manipulation and earnings-smoothing consequences of such non-discretionary causes as the fundamental earnings process or the application of accounting rules (Dechow et al., 2010).

2.2.3 Earnings persistence.

Persistence enhances the decision usefulness of earnings because sustainable earnings are expected to be a better indicator of future cash flows, improving investors' valuation (Dechow et al., 2010). Sustainability is associated with earnings persistence – the extent to which earnings in one year predict future earnings (Freeman, Ohlson, & Penman, 1982).

The most commonly used empirical proxy for earnings persistence is the auto-regression coefficient of earnings on lagged earnings: The higher that coefficient, the more persistent earnings are, because current earnings explain a greater proportion of future earnings. This model of auto-regression coefficients has also been extended by disaggregating lagged earnings into cash flows and the main components of accruals, based on the idea that the cash-flow component of earnings has greater predictive ability than the accrual component does (Sloan, 1996). Thus a higher coefficient for current cash flows indicates that more future earnings are explained by a permanent component (cash flows) than by a transitory component (accruals). Rather than analysing the earnings coefficient, then, only the cash-flow coefficient is considered a measure of persistence (the greater the cash-flow coefficient, the greater the earnings persistence). Finally, variance of earnings has also been used as a proxy to analyse the extent of persistence: Higher earnings variance indicates lower earnings persistence because earnings volatility affects the temporary component of earnings, lowering earnings persistence (Clubb & Wu, 2014).

Researchers have also criticized persistence models for misspecification and endogeneity. Regarding *misspecification*, observed extent of persistence can be due to earnings management, eventually leading to lower persistence of non-manipulated earnings. Consequently, the relationship to earnings management should be considered to distinguish artificial from real earnings sustainability (Dechow et al., 2010; Kothari et al., 2005; Schipper & Vincent, 2003). Regarding *endogeneity*, persistence is a conjunctive variable of the quality of financial reporting and the accounting system that measures it (Barth, 2000; Dechow & Ge, 2006; Dechow et al., 2010). Persistence influences the quality of financial reporting, which determines the quality of the accounting system; but the quality of the accounting system also determines financial-reporting quality.

2.2.4 Conservatism.

Conservatism is a prudent reaction to uncertainty, reflecting in accounting the risk and uncertainty of a firm's performance (FASB, 1980). Accounting research literature distinguishes between conditional and unconditional conservatism. *Conditional conservatism*[3] is the tendency to require a higher degree of verification to recognize good news than to recognize bad news (Basu, 1997) and is considered as positively associated with earnings quality because it helps to reduce overinvestment problems (Mora & Walker, 2015), constrain income-increasing accruals manipulation (García Lara, García Osma, & Penalva, 2018), and enhance debt-contracting efficiency (Beatty, Petacchi, & Zhang, 2012; Wittenberg-Moerman, 2008; Zhang, 2008). *Unconditional conservatism*[4] is the choice of a lower/higher-than-expected value in the estimation of assets or revenue valuation under uncertainty (Ball & Shivakumar, 2005) and is associated with a lower earnings-quality level. Various empirical studies have shown that it can lead to inefficient investments (Jackson, 2008; Jackson & Cechinni, 2009) and may provide more opportunities for earnings manipulation (Jackson & Liu, 2010).

Conditional-conservatism proxies.

The most frequently used measures of conditional conservatism are based on the loss-differential-timeliness concept developed by Basu (1997): Under conditional conservatism, the requirements for recognizing good news (gains) are stricter than those for recognizing bad news (losses). Consequently, it can be expected that losses will be recorded in a more timely fashion than good news is. Using market returns as the proxy for good and bad news, Basu (1997) showed that the correlation between negative market returns (a proxy for bad news) and earnings is higher than the correlation between positive market returns (good news) and earnings, using the differential

[3] Some authors refer to conditional conservatism as earnings conservatism, ex-post conservatism, or information-driven conservatism (Mora & Walker, 2015).

[4] Also known as balance-sheet conservatism or ex-antes conservatism (Mora & Walker, 2015).

timeliness coefficient between negative and positive market returns as the indicator of conditional conservatism. Despite its popularity, Basu's differential timeliness presents drawbacks. Several researchers have questioned its reliability in measuring conditional conservatism (Cano-Rodríguez & Nunez-Nickel, 2015; Dietrich, Muller, & Riedl, 2007; Givoly, Hayn, & Natarajan, 2007; Patatoukas & Thomas, 2011), and identified two limitations preventing its application in some settings. Basu's (1997) differential timeliness coefficient is not measured at the firm-year level; consequently, other authors have developed firm-year-specific measures of conditional conservatism: Khan and Watts's (2009) C-Score model, Callen, Segal and Hope's (2010) conservatism-ratio model, and, the Barth et al. (2014) model.

A second limitation is the information required by Basu's differential-timeliness coefficient on market returns for proxying good and bad news; it does not apply, therefore, when this information is not available, as in private companies. Researchers attempting to solve this limitation have developed various measures of conditional conservatism based exclusively on reported financial information. One such measure is the difference in reversals of the transitory components of earnings: If losses are recorded timelier than gains, negative variations in earnings will have a greater tendency than positive ones to reverse in the next period (Basu, 1997). Consequently, conditional conservatism can be captured by the differential mean reversion in earnings changes. This measure shares several problems, however: It is not measured at the firm-year level, it can be contaminated by transitory components in earnings produced by random errors or earnings manipulations, and it can identify only transitory components, and not whether they are recognized in a timely manner (Ball & Shivakumar, 2005).

Ball and Shivakumar (2005) developed an alternative measure of conditional conservatism based on the asymmetric contemporaneous correlation between accruals and cash flows. Thus, decreases in the current-period cash flows of an investment are likely to be associated with decreases in the expected future cash flows. Under conditional accounting, those decreases should be recognized through accruals, thereby producing a positive association between current cash flows and accruals, and making the correlation between cash flows and accruals closer to zero[5] for losses than for gains. The asymmetry of earnings compared to cash flows is another measure of conservatism based exclusively on accounting information. Thus, as conditional conservatism leads to an immediate and complete recognition of bad news and a lagged, gradual recognition of good news, earnings are expected to be left-skewed relative to operating cash flows (Gassen, Uwe Fülbier, & Sellhorn, 2006; Givoly & Hayn, 2000).

Unconditional conservatism proxies.

Unconditional conservatism is less prevalent in accounting research than conditional conservatism is (Ruch & Taylor, 2015). The most common empirical measures for unconditional conservatism are the market-to-book ratio, the accumulation of negative accruals, and the existence of hidden reserves.

Regarding the market-to-book (MTB) ratio, the stricter requirements for recording gains than for recording losses would lead to the undervaluation of the book value of equity with respect to the market value, which is assumed to recognize gains and losses in a timely manner (Beaver & Ryan, 2000; Feltham & Ohlson, 1995; Givoly & Hayn, 2000; Watts, 2003). Consequently, it can be expected that conservatism contributes to an increase in the MTB ratio. The MTB ratio also presents some problems, however. It is also affected by economic rents, which are not recognized in accounting because of accounting principles (Roychowdhury & Watts, 2007), so it would be necessary to adjust the ratio to control the effect of those rents. Additionally, the MTB ratio would be affected by both, unconditional and conditional types of conservatism, so it will likely measure unconditional conservatism with error (Gassen et al., 2006).

---

[5] Dechow and Dichev (2002) have demonstrated that the theoretical relationship between accruals and cash flows is negative in the absence of conservatism.

A second measure of unconditional conservatism used in previous research is the accumulation of negative accruals. A consistent predominance of negative accruals over a long period would be, *ceteris paribus*, indicative of conservatism (Givoly & Hayn, 2000).

Finally, unconditional conservatism contributes to the creation of hidden reserves if some assets are not recorded. Penman and Zhang's (2002) conservatism measure is the estimation of those hidden reserves divided by net operating assets. The main drawback of this measure, however, is its dependence on the availability and quality of information on those hidden reserves.

2.2.5 A summary of the review on accounting properties.

We group the studies on the accounting properties that form earnings quality into four categories: (Absence of) earnings management, earnings smoothing, earnings persistence, and conservatism. The existence of various different empirical proxies for each property and, moreover, that almost all the reviewed empirical proxies present limitations that condition their validity, lead us to conclude that there is no clear consensus in the literature about how to measure these properties empirically..

Additionally, as shown in Figure 1, studies on earnings quality are not evenly distributed among the four properties. Recognizing that a single study may include analysis of more than one accounting property and percentages may add to more than 100%, it is clear that the majority of studies on earnings quality analyse the earnings-management property (350/472: 74%), followed by the conditional conservatism property (109/472: 23%). The number of articles analysing the accounting properties of persistence, earnings smoothing, or unconditional conservatism is notably lower: 79/472 (17%), 67/472 (14%), 50/472 (11%), respectively). Thus, although none of the earnings-quality measures can be considered superior for all decisions (Dechow et al., 2010), previous research focused more on earnings-management and conservatism measures than on the other two accounting properties of earnings. This preponderance of earnings management in research, however, is not in line with the opinion of practitioners, because earnings management is not very relevant for analysts' decision process (L. D. Brown, Call, Clement, & Sharp, 2015).

2.3. DISCUSSION OF RESULTS OF THE ANALYSIS OF EMPIRICAL RESEARCH ON THE MULTIDIMENSIONAL NATURE OF EARNINGS.

In this section we present the results of the analysis of empirical research about the multidimensional nature of earnings quality that can be highlighted from the bibliometric review undertaken in this study. Table 1 classifies the number of papers that have analysed each proxy according to their unidimensional or multidimensional approach for earnings quality measurement.

2.3.1 Single-dimension approach.

Under this category, we classify those papers that do not consider the multidimensional nature of earnings in their approach, but measure earnings quality using only one of the earnings-quality properties (earnings management, earnings smoothing, persistence, or conservatism). Two types of works are considered in this category: (1) Papers representing earnings quality using only *one accounting property* do not control for other dimensions of earnings quality and focus merely on that property. (2) Papers with two or more earnings properties as proxies for earnings quality analysed *as separate models*, thereby considering the multidimensionality of earnings quality, but not the inter-relationships among the different earnings properties; they provide various separate single-dimension analyses rather than a real multidimensional analysis.

2.3.1.1 One-property studies.

As shown in Table 1, most of the reviewed papers (334/472: 70.8%) consider only one earnings property for measuring earnings quality, using just one proxy for measuring that property (283/472: 60%), or using several different proxies for that property (51/472: 10.8%).

TABLE 1: NUMBER OF PAPERS ACCORDING TO THE MULTIDIMENSIONAL APPROACH OF EACH CATEGORY

(NOTE: A single paper may be classified in more than one category, as it may measure more than one earnings property)

	Single-dimensional studies							Multi-dimensional studies						
	One property (334)	Various properties separate (107)						Inter-relationships among the properties (19)						Composite measures (indices) (12)
		EM (61)	S (35)	P (36)	CC (46)	UC (29)	Total (107)	EM (16)	S (5)	P (10)	CC (6)	UC (7)	Total (19)	
Earnings management (350)	235		29	27	25	6	61		4	9	4	4	16	12
Smoothing (67)	13	29		15	10	5	35	4		2	1	1	5	11
Persistence (79)	23	27	15		9	3	36	9	2		3	3	10	3
Conditional conservatism (109)	49	25	10	9		24	46	4	1	3		0	6	2
Unconditional conservatism (50)	14	6	5	3	24		29	4	1	3	0		7	0

Table 1 summarizes the number of papers in which each of the proxies of earnings quality has been analysed. Information is divided into three columns: (1) *Accounting properties of earnings* – Earnings management (EM), smoothing (S), persistence (P), conditional conservatism (CC), and unconditional conservatism (UC); (2) *Single-dimension studies* that consider the properties of accounting information/categories of earnings quality separately. This column is divided into two columns: (i) One property studies, in which only one property of earnings is analysed, with a single proxy or several proxies for the same property; (ii) Various properties studies that analyse several properties of accounting information/categories of earnings quality in separate regressions. (3) *Multi-dimension studies* that consider different properties/categories in the same analysis. This column is divided into two columns: (i) Inter-relationships among the properties – studies in which one of the properties/categories is considered an explanatory variable and another is considered an explained variable; (ii) Composite measures (indices) – studies that form a composite measure (index) of earnings quality such as the aggregation of rankings of several properties of accounting information.

NOTE: For each column and for the different accounting properties of accounting information in Column 1, the total number of papers in the category is indicated between brackets.

From these results, we conclude two key features about the research on earnings quality: (1) The great majority of papers do not account for the multidimensional nature of earnings quality, because more than the70% per cent of the reviewed papers dealt with just one of the earnings quality properties. (2) This unidimensional research is not uniformly distributed across earnings properties, but is concentrated on earnings management (235/334: 70.4% unidimensional papers study earnings management) and, in a lower proportion, conditional conservatism (49/334: 14.7%). Earnings persistence (23/334: 6.9%), unconditional conservatism (14/334: 4.2%), and earnings smoothing (13/334: 3.9%) are much less studied by empirical researchers.

2.3.1.2 Studies that analyse various properties in separate models.

This second group includes all the studies (107/472: 22.7%) that analysed two or more earnings properties in separate models, with no analysis of the possible inter-relationships among those properties. Earnings management is the most frequently analysed property (61/107: 57.0%), followed by conditional conservatism (46/107: 43.0%). Analysing the combination of properties, the most common pairings were earnings management and earnings smoothing (29/107: 27.1%), earnings management and persistence (27/107: 25.2%), and earnings management and conditional conservatism (25/107: 23.4%). Unconditional conservatism was not often analysed (29/107: 27.1%) and, when it was, it tended to be paired with conditional conservatism (24/29: 82.8%).

2.3.1.3 Statistical problems associated with unidimensional studies of earnings quality.

The two previous sections reviewed those papers that represent earnings quality construct by a single dimension or by various dimensions in separate models –by far the most common approach in empirical earnings-quality research.

This section focuses on the statistical problems that can arise when a multidimensional construct such as earnings quality is measured using only one of its dimensions. These problems are analysed in two potential situations, following Dechow et al. (2010): (1) When earnings quality is an explanatory variable (i.e., analyses of the consequences of earnings quality), and (2) when earnings quality is the explained variable (i.e., studies on the determinants of earnings quality).

Earnings quality as the explanatory variable.

To demonstrate these statistical problems, consider a parsimonious model in which the construct earnings quality (EQ) is formed by two observable dimensions (EQ_1 and EQ_2):

$$EQ = \alpha_0 + \alpha_1 \cdot EQ_1 + \alpha_2 \cdot EQ_2 + \varepsilon_1. \quad [1]$$

Assuming that a researcher wants to estimate the influence of earnings quality on some given dependent variable *Y*, the real relationship between them can be expressed as in the following equation:

$$Y = \beta_0 + \beta_1 \cdot EQ + \varepsilon_2. \quad [2]$$

As *EQ* is not observable, the researcher estimates the relationship between dependent variable *Y* and one observable dimension (e.g., EQ_1). As demonstrated in Appendix A, by substituting the multidimensional construct *EQ* by one of its components, the researcher incurs an error-in-variables problem, resulting in a biased estimation of the relationship between *EQ* and *Y* (β_1). This bias (θ_1) would be:

$$\theta_1 = \beta_1 \cdot \left[\alpha_1 + \alpha_2 \cdot \frac{Cov(EQ_1, EQ_2)}{Var(EQ_1)} - 1\right]. \quad [3]$$

The bias size will depend on the value of the relationship between *EQ* and Y (β_1), the relationship between *EQ* and EQ_1 (α_1), and the product of the relationship between *EQ* and EQ_2 (α_2), with the regression coefficient of EQ_2 on EQ_1. As shown in Appendix A, this bias will equal 0 only under highly restrictive conditions.

Alternatively, the researcher's interest may be in estimating the influence on *Y* of the specific component EQ_1, and not the influence of *EQ*. In this case, the estimated coefficient can also be biased because of the omission of the other components of *EQ*, which depends on the correlation between EQ_1 and the other components of *EQ*, as shown in Appendix A.

Earnings quality as an explained variable.

In this case, assume that the researcher is interested in estimating the influence of a given variable X on earnings quality *EQ*:

$$EQ = \gamma_0 + \gamma_1 \cdot X + \varepsilon_4. \qquad [4]$$

In Appendix A, it is demonstrated that, if the researcher tries to estimate the influence of *X* on *EQ* (γ_1) through the influence of X on the component EQ_1, the estimated coefficient would be a biased one, which can be represented as:

$$\theta_3 = \left(\frac{1}{\alpha_1} - 1\right) \cdot \gamma_1 - \frac{\alpha_2}{\alpha_1} \cdot \frac{Cov(EQ_2, X)}{Var(X)}. \qquad [5]$$

As shown in Appendix A, this bias will equal 0 only under highly restrictive conditions.

In summary, the replacement of composite construct *EQ* by one of its components will likely produce biased estimates when earnings quality is an explanatory variable and when it is the explained variable.

2.3.2 Multidimensional approach.

We classified a paper as having a multidimensional approach if the researcher analysed the relationship among various earnings properties or synthetized a composite measure of earnings quality using empirical proxies from various properties. In two subsections we present the highlights for each of these two multidimensional approaches. We start with papers analysing the significance and sign of relationships between pairs of properties (considering one property as explanatory and another as explained variable). Later, we indicate the estimation procedures for composite measures of earnings quality (those including two or more properties in the measure), summarizing the main problems.

2.3.2.1 Papers that study the empirical relationships among earnings properties.

As observed in Table 1, of the 472 papers that study accounting properties, only 19 (4%) examined the relationships among different measures of earnings quality. Within these papers, 17 (3.6%), listed in Table 2, examined the relationships among the different earnings properties and 2 (.04%) analysed the correlation between one of the properties and market reaction. Although the empirical research has found non-zero correlations among these properties, the results are mixed.

Earnings-management – Persistence relationship.

Panel A, Table 2 presents the six papers from the sample in which researchers studied the relationship between earnings management and persistence. Most of them contend that, by managing earnings, managers decrease the persistence of earnings because they add noise to the reported earnings, thereby worsening the ability of current earnings to predict future earnings (Chang, Suh, Werner, & Zhou, 2012; Dechow & Dichev, 2002; Huang, Teoh, & Zhang, 2014) and other future events such as bankruptcy (Beaver, Correia, & McNichols, 2012). Their results corroborate this expectation, showing a negative relationship between earnings management and persistence.

TABLE 2: PAPERS EMPIRICALLY ANALYZING THE CORRELATIONS BETWEEN EARNINGS PROPERTIES

Author	***Explained variable***	***Explanatory variable***	***Relationship***	***Theoretical justification***
PANEL A: EARNINGS MANAGEMENT AND PERSISTENCE				
Dechow and Dichev (2002)	Persistence	Earnings management	Negative	A high level of accruals implies that earnings better reflect underlying cash flows. This benefit comes at the cost of incurring estimation errors, however.
Yeo et al. (2002)	Earnings management	Persistence	Positive	Managers in their choice of accepted accounting procedures reflect accounting numbers for personal benefit, influencing the informativeness of earnings with apparent, more persistent earnings.
Dechow et al. (2010)	Earnings management/ Persistence	Earnings management/ Persistence	Negative	Not provided.
Wang et al. (2011)	Persistence	Earnings management	Positive	Managers engaged in empire building avoid attracting attention to low-growth segments, making earnings artificially less volatile.
Chang et al. (2012)	Persistence	Earnings management	Negative	If managers decrease discretionary reporting of reliable information, information asymmetry between management and investors will increase, lowering persistence.
Huang et al. (2014)	Persistence	Earnings management	Negative	Firms with lower earnings have less readable annual reports, and readability increases with earnings persistence. Managers report tone strategically, trying to lower persistence of earnings.
PANEL B: EARNINGS MANAGEMENT AND SMOOTHING				
Dechow et al. (2010)	Earnings management/ Smoothing	Earnings management/ Smoothing	Positive	Not provided.
Guan and Pourjalali (2010)	Earnings management	Smoothing	Positive	The higher the earnings smoothing, which is strongly influenced by the culture of a country, the higher the expected extent of earnings management.
Boterenbrood (2014)	Smoothing	Earnings management	Positive	Managers manipulate earnings so as to smooth reported earnings because of contracting incentives.

TABLE 2: PAPERS EMPIRICALLY ANALYZING THE CORRELATIONS BETWEEN EARNINGS PROPERTIES (Continued)

PANEL C: EARNINGS MANAGEMENT AND CONSERVATISM				
García Lara et al. (2005)	Earnings management	Unconditional conservatism	Positive	When managers have incentives to reduce or delay the recognition of earnings, they take additional income-decreasing measures beyond investor protection objectives (unconditional conservatism). This increases reflected discretionary accruals.
Pae (2007)	Conditional conservatism	Earnings management	Positive	Managers have incentives to expedite the recognition of bad news (increasing earnings management) to lower litigation risk.
Ashbaugh et al. (2008)	Earnings management	Conditional conservatism	Negative	By requiring that only verifiable information is reported in accounting, conservatism improves accruals quality, reducing earnings management.
Dechow et al. (2010)	Earnings management/ Conditional conservatism	Earnings management/ Conditional conservatism	Negative	Not provided.
Houmes and Skantz (2010)	Earnings management	Conditional conservatism	Positive	Highly valued firms are more likely than others to report low future stock returns, to have incentives to recognize negative accruals, and to report bad news and reduce litigation risk.
Jackson and Liu (2010)	Earnings management	Unconditional conservatism	Positive	Income-increasing bad-debt expense (earnings management) is more readily recorded when the allowance is conservative because more previously recorded over-accruals of bad debt expense have accumulated on the balance sheet.
PANEL D: PERSISTENCE AND SMOOTHING				
Tucker and Zarowin (2006)	Persistence	Smoothing	Positive	If earnings are more smoothed and maintained in time, earnings will be more persistent and useful for investors.
Dechow et al. (2010)	Persistence / Smoothing	Persistence / Smoothing	Negative	Not provided.
PANEL E: PERSISTENCE AND CONSERVATISM				
Bandyopadhyay et al. (2010)	Predictability	Unconditional conservatism	Mixed	Increasing conservatism over time has led to an increase in the ability of current earnings to predict future cash-flows, but to a decrease in its ability to predict future earnings

TABLE 2: PAPERS EMPIRICALLY ANALYZING THE CORRELATIONS BETWEEN EARNINGS PROPERTIES (Continued)

Dechow et al. (2010)	Predictability/ Conditional conservatism	Predictability/ Conditional conservatism	Positive	Not provided.
Chen et al. (2014)	Predictability	Conditional and unconditional conservatism	Negative for conditional conservatism; positive for unconditional conservatism	Conditional conservatism decreases persistence during bad- news periods and increases persistence during good news periods. Unconditional conservatism is expected to increase earnings persistence because it is continually implemented.
PANEL F: SMOOTHING AND CONSERVATISM				
Gassen et al. (2006)	Conditional and unconditional conservatism	Smoothing	Negative	The correlation between income smoothing and conditional conservatism depends on the difference between the variance-increasing effect of timelier loss recognition and the variance-decreasing effect of less timely gains recognition.
Dechow et al. (2010)	Smoothing/ Conditional conservatism	Smoothing/ Conditional conservatism	Positive	Not provided.

Table 2 summarizes articles that empirically analyse the correlations between pairs of earnings properties that are indicative of earnings quality, analysing the significance of the coefficient in a regression in which one of the properties is the explanatory variable and another property is the explained variable.

In contrast, other authors consider that the correlation between these two properties could be positive, because managers can use their discretion to reveal relevant information that would make earnings more persistent. These authors argue that utilizing stricter accounting that limits earnings management would also reduce managers' capability to reveal their predictions about the firms' future economic performance in financial statements (Barth, Landsman, & Lang, 2008; Ewert & Wagenhofer, 2005; Perotti & Wagenhofer, 2014), thereby reducing the persistence of earnings (Ashbaugh & Pincus, 2001; Schipper & Vincent, 2003). Consistent with this idea, some empirical evidence shows that managers improve earnings informativeness through accounting decisions, making them more persistent (Wang et al., 2011; Yeo et al., 2002).

Earnings management – Smoothing.

Panel B of Table 2 reports the three reviewed papers that empirically tested the correlation between earnings management and smoothing. It can be argued theoretically that lower-earnings variability can be due to a regular performance of the firm or artificially achieved through earnings manipulation (Schipper & Vincent, 2003; Wilson, 2011). In this regard, empirical evidence has primarily analysed the influence of earnings management on earnings smoothing, showing that managers deliberately manipulate earnings to smooth earnings (Boterenbrood, 2014; Guan & Pourjalali, 2010; Yeo et al., 2002). Empirical evidence is consistent with this expectation, as the three reviewed papers found a positive relationship between earnings management and income smoothing. In summary, both theory and empirical evidence support the existence of a positive correlation between earnings management and smoothing, although this evidence is based on the idea that managers manipulate earnings with the aim of smoothing earnings.

Earnings management – Conservatism.

The expected relationship between earnings management and conservatism depends on the type of conservatism considered. Conditional conservatism is expected to decrease earnings management, because it delays the recognition of good news and encourages timely recognition of bad news (Ball, Kothari, & Ashok, 2000; Ball & Shivakumar, 2005; García Lara, García Osma, & Penalva, 2009; Mora & Walker, 2015). Although it could be argued that conditional conservatism could facilitate big-bath earnings management (Mora & Walker, 2015; Ruch & Taylor, 2015), no empirical studies support this possibility.

As expected, various empirical studies show a negative influence of conditional conservatism on earnings management (Ashbaugh et al., 2008; Dechow et al., 2010). Yet Pae (2007) and Houmes and Skantz (2010) found a positive relationship between conditional conservatism and discretionary accruals, indicating that managers may use their discretion to expedite the recognition of bad news, thereby producing a positive correlation between earnings management and conditional conservatism.

Unconditional conservatism, on the other hand, is expected to increase opportunities for earnings management (Ruch & Taylor, 2015) because it creates hidden reserves that can be used to increase earnings when conservatism is reversed (Penman & Zhang, 2002). This relationship between unconditional conservatism and earnings manipulation therefore depends on the firm's possibilities of reversing past unconditional conservatism (Mora & Walker, 2015). Empirical works employing related unconditional conservatism and earnings management proxies have typically found a positive correlation between them (García Lara et al., 2005; Jackson & Liu, 2010).

In summary, conditional conservatism is expected to be negatively related to earnings management, although some empirical papers suggest that discretionary accruals and conditional conservatism proxies can be positively related in some cases. Unconditional conservatism, on the other hand, is expected to be positively related to earnings management. Panel C of Table 2 reports the reviewed empirical papers that addressed the relationship between these two properties.

Persistence – Smoothing.

Theoretically, these properties are expected to be positively linked because a lower variance of earnings would make earnings more persistent (Schipper & Vincent, 2003). This expectation has been supported by empirical findings, providing evidence that smoothed earnings maintained for a long time are more persistent and useful for the users of financial information than non-smoothed earnings (Tucker & Zarowin, 2006). Dechow et al. (2010) reported a negative correlation between earnings smoothing and earnings persistence, however, but provided no theoretical explanation for this result. Panel D, Table 2 reports the studies that have analysed this relationship empirically.

Persistence – Conservatism.

The relationship between conservatism and persistence also depends on the type of conservatism. Regarding conditional conservatism, Basu (1997) argued that, as losses must be recognized earlier and more completely than gains, losses can be expected to be less persistent than gains. The relationship between conditional conservatism and conservatism would then be asymmetric: Conservatism reduces persistence in the reporting of bad news and increases persistence in the reporting of good news (Chen et al., 2014). The main effect of conditional conservatism on persistence, therefore, would be an empirical issue. Unconditional conservatism, on the other hand, can increase earnings persistence because it is continually implemented, and can makes its recognition more predictable and correlated through time (Chen et al., 2014).

Panel E, Table 2 lists the papers reporting a relationship between conservatism and persistence. The empirical results are mixed: Whereas Chen et al. (2014) found that conditional conservatism reduces persistence, Dechow et al. (2010) observed a positive correlation between these two properties. Regarding unconditional conservatism, empirical results generally support its relationship to increased persistence, but with some caveats. Thus, Chen et al. (2014) evidenced that unconditional conservatism increases earnings persistence. Bandyopadhyay et al. (2010) reported results corroborating the greater ability of unconditional conservatism to forecast future cash flows, but they also showed that unconditional conservatism reduces the ability of current earnings to forecast future earnings.

Smoothing – Conservatism.

Similar to the relationship between smoothing and conditional conservatism, previous literature distinguishes between the effects of conservatism on smoothing in the presence of good versus bad news. Gassen et al. (2006) analysed the relationships between earnings smoothing and conditional conservatism, and earnings smoothing and unconditional conservatism, and found weak negative correlations of earnings smoothing with the two types of conservatism. Panel F, Table 2 reports the works that have analysed this relationship.

This review of the works that have analysed the different inter-relationships among the four earnings properties reveals some relevant features. (1) Only a few papers have tried to analyse the inter-dependence between the different quality-related earnings properties. (2) More research is required on contradictory empirical results showing both positive and negative empirical correlations (e.g., between earnings management and predictability, between earnings management and conservatism, and between unconditional conservatism and predictability). (3) Overall, these papers show that the different earnings properties are intercorrelated. As demonstrated in the previous section, these non-zero correlations may cause the models that measure earnings quality using the single-dimension approach to produce biased estimates.

2.3.2.2 Composite-measure studies.

The second group of multi-dimensional studies comprises those works that have developed a composite measure of earnings quality that includes two or more earnings properties. Table 3 reports the 12 papers (2.5% of total) that use a composite measure of earnings quality by combining proxies of different properties.

TABLE 3: PAPERS USING A COMPOSITE MEASURE OF EARNINGS QUALITY

Author	***Properties included in the composite measure***			
	Earnings management	Earnings smoothing	Earnings predictability	Conservatism
Bhattacharya et al. (2003)	x	x		x
Biddle and Hilary (2006)	x	x		x
Burgstahler et al. (2006)	x	x		
Doupnik (2008)	x	x	x	
Francis et al. (2008)	x		x	
VanTendeloo and Vanstraelen (2008)	x	x		
Boulton et al. (2011)	x	x		x
Gaio and Raposo (2011)	x	x	x	x
Bhattacharya et al. (2012)	x		x	
Brown et al. (2014)	x	x		x
Healy et al. (2014)	x	x		
Jung et al. (2014)	x		x	

Table 3 summarizes the articles using composites measures of earnings quality: indices composed by rankings of different proxies of earnings properties. It is divided into two columns: (1) Author/s (year) of the article and (2) Earnings properties included in the measure. This column is divided into the four accounting properties of earnings: earnings management, smoothing, predictability, and conservatism.

Although they vary on the earnings properties included in the analysis or the proxies used to measure earnings properties, they follow the same methodology: The earnings-quality composite measures are multivariable indices of various proxies of earnings properties. These indices are built by aggregating the ranking (usually the decile to which the observation belongs) of each proxy or by applying principal components analysis to the different proxies. The result, then, is a composite variable that attempts to represent the construct of earnings quality.

These papers differ in which specific earnings properties are included in the composite measure. Only one of the reviewed papers (Gaio & Raposo, 2011) included proxies for the four earnings properties described in this work; five papers included proxies for three earnings properties and the remaining six included only two properties. Consistent with the predominance of earnings management in earnings-quality research, this property is included in all the papers. Earnings smoothing was included in 9 of the 12 papers as the second-most-used property in these indices; conservatism and persistence were used in only 5 papers each.

Leuz and Wysocki (2016) argue that these composite measures have various limitations.

(1) The selection of proxies for building the measures is subjective; only one of the papers using this type of measure included proxies for the four earnings properties. The other papers may also be affected by the omitted-variables bias previously indicated for the single-dimension-approach studies.

(2) A second limitation is related to the weights assigned to each proxy. The most common method is to assign equal weights, implicitly assuming that all proxies have equal importance, or to apply principal component analysis. In any case, there is no guarantee that those weights faithfully represent the relative importance of each earnings property on the earnings-quality construct.

(3) These composite measures do not control for correlations among the proxies. Whether the included proxies are complements or substitutes has not been tested, so

various papers use several proxies to represent the same property. Because the expected correlation between these proxies is high, they are likely redundant.

(4) The mere addition of the proxies does not necessarily solve the measurement problems. Besides, there is no evidence for the superiority of these combined measures over single-property measures.

These limitations can be complemented with an analytical exploration of the estimation problems that can arise with the use of aggregate indices as composite measures. Using the parsimonious model of earnings quality presented in Appendix A, a composite index can be constructed using the observed values of the two earnings-quality components, and the potential errors that may arise when the construct earnings quality is replaced by that composite index can be analysed (see Appendix B.) In summary, as shown in the econometric analysis, the use of indices renders biased estimations of the parameters. Disaggregating the components of the bias in the equations, the problems that arise in the use of these indices are twofold.

(1) Given that the correlation between a variable and its categorized values is expected to be positive, the sign of the coefficient in the empirical model (index measure) will be the same as the sign of the coefficient in the theoretical model (multidimensional earnings-quality measure).

(2) The value of the estimated coefficient in the empirical model will differ from the theoretical model, and this difference is dependent on two factors: (a) the correlations between the theoretical variable of earnings quality and the categorized index variables, and (b) the variances of the variables included in the index.

According to the equations, the correlations depend on such aspects of the internal structure of earnings quality as the coefficients of the different properties that form the index and the correlation among them. Then, even with standardized variables, the second factor could be mitigated, but not the first.

In Appendix B, to gain a better understanding of these problems, a simulation procedure was run, in which two variables were randomly generated. An explanatory variable was formed by the average of these random variables and an index with the rank by deciles of these random variables was generated. Finally, the explained variable was generated and the coefficients of the theoretical regression model between the explained variable and the explanatory variable was analysed and compared with the coefficients when the explanatory variable was the index. The sign of the coefficient did not change. According to econometrics, however, the size of the coefficient of the ranking variable is always smaller. Moreover, as shown by econometric analysis, simulation shows that the difference between coefficients decreases as the correlation between the variables included in the index increases. Finally, the coefficients are more similar when variables are standardized, indicating that the scale factor is the main driver of the potential bias. In conclusion, standardized indices may be a reasonable method for measuring multidimensional earnings quality. Standardized coefficients cannot eliminate the persistent bias, however, due to the correlation factor.

2.4 CONCLUSIONS FOR CHAPTER 2.

The earnings literature broadly accepts that earnings quality is a multidimensional concept, as there are various useful earnings properties for improving decision-making. This chapter reviews the empirical research on earnings quality. Following Dechow et al. (2010), a differentiation was made between proxies representing various accounting properties related to earnings quality (earnings properties) versus other proxies based on the evaluation of earnings quality by external parties (market reactions and other measures). Focusing on the first group, the different empirical proxies were categorized into four groups, representing the four properties that configure earnings quality: earnings management, earnings smoothing, earnings persistence and conservatism.

Despite theoretical consensus on the multidimensionality of earnings quality, empirical research has widely adopted a unidimensional approach: More than 90% of the reviewed papers analysed just one of the four earnings properties or analysed various properties, but separately. It was demonstrated analytically that by substituting the composite earnings quality construct by a single property models are likely to render biased estimates of the relationships between earnings quality and its determinants or consequences.

Additionally, this review shows that the research on earnings quality is heavily oriented toward earnings management and, to a lesser extent, to conservatism. Research on earnings smoothing and earnings predictability is much less prevalent.

Only 31 papers adopted a multidimensional approach in earnings-quality empirical research; 17 of them analysed inter-relationships among the four earnings properties, and 2 analysed inter-relationships among the properties and market reactions. The few papers that investigated these relationships and the mixed results they reported strongly suggest the need for additional research. The remaining 12 papers developed a composite measure of earnings quality – largely composite indices formed by the aggregation of the ranks of different proxies of earnings properties. This solution has a number of limitations, however, including the absence of some properties in most of these papers, the subjective selection of the proxies and their weights, and lack of control over the correlations among the proxies.

In summary, there is a gap between the theoretical concept of earnings quality (a multidimensional construct) and the empirical literature aimed at measuring it. To close this gap, empirical researchers should adopt multidimensional earnings-quality measures, accounting for the correlations among various properties and assigning optimal weights for all proxies.

One potential research path is the application of structural estimation for earnings-quality measures (Leuz & Wysocki, 2016). Structural Equation Modelling (SEM) works with a multivariate analysis, simultaneously examining several hypothesized relationships among one or more independent and dependent variables (Tabachnick & Fidell, 2007). Given that earnings quality is an unobservable concept, this technique is suitable for its measurement, because it analyses the relationships between directly observable and/or non-directly observable variables, while incorporating potential measurement errors (Lee et al., 2011). Moreover, earnings quality has been measured with multiple proxies, most of which are correlated with each other. The omission of correlated variables leads to biases in the estimation but, if variables are correlated and measure the same concept, their inclusion may cause multicollinearity problems. For that reason, SEM appears a more appropriate method than OLS for earnings-quality measurement, given that it allows for the inclusion of as many indicators as needed to explain unobservable concepts, even if these indicators are inter-correlated (Reinartz, Haenlein, & Henseler, 2009) – thereby solving the multicollinearity problem. Furthermore, the estimation of SEM models explicitly incorporates the correlation between variables for the mathematical calculation (Wold, 1980), thereby solving the problem of ignoring the correlation between properties. Finally, regarding the optimal weights in composite measures of earnings quality, SEM may solve this problem because it offers optimal weights for all the indicators, assigning greater weights for proxies that better explain the variable (Ullman, 2006).

2.5 REFERENCES FOR CHAPTER 2.

Ashbaugh, H., Collins, D. W., Kinney, W. R. J., & LaFond, R. (2008). The effect of SOX internal control deficiencies and their remediation on accrual quality. *The Accounting Review*, *83*(1), 217–250.

Ashbaugh, H., & Pincus, M. (2001). Domestic accounting standards, international accounting standards, and predictability of earnings. *Journal of Accounting Research*, *39*(3), 417–434.

Ball, R., Kothari, S. P., & Ashok, R. (2000). The effect of international institutional factors on properties of accounting earnings. *Journal of Accounting & Economics*, *29*(1), 1–51.

Ball, R., & Shivakumar, L. (2005). Earnings quality in UK private firms: comparative loss recognition timeliness. *Journal of Accounting & Economics*, *39*(1), 83–128.

Bandyopadhyay, S. P., Chen, C., Huang, A. G., & Jha, R. (2010). Accounting Conservatism and the Temporal Trends in Current Earnings' Ability to Predict Future Cash Flows versus Future Earnings: Evidence on the Trade-off between Relevance and Reliability. *Contemporary Accounting Research*, *27*(2), 413.

Barth, M. E. (2000). Valuation-based accounting research: Implications for financial reporting and opportunities for future research. *Accounting and Finance*, *40*(1), 7–31.

Barth, M. E., Landsman, W. R., & Lang, M. H. (2008). International Accounting Standards and Accounting Quality. *Journal of Accounting Research*, *46*(3), 467–498.

Barth, M. E., Landsman, W. R., Ravel, V., & Wang, S. (2014). *Conservatism and the information content of earnings*.

Basu, S. (1997). The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting & Economics*, *24*(1), 3–37.

Beatty, A., Petacchi, R., & Zhang, H. (2012). Hedge commitments and agency costs of debt: evidence from interest rate protection covenants and accounting conservatism. *Review of Accounting Studies*, *17*, 700–738.

Beaver, W. H., Correia, M., & McNichols, M. F. (2012). Do differences in financial reporting attributes impair the predictive ability of financial ratios for bankruptcy? *Review of Accounting Studies*, *17*(4), 969–1010.

Beaver, W. H., McNichols, M. F., & Nelson, K. K. (2007). An alternative interpretation of the discontinuity in earnings distributions. *Review of Accounting Studies*, *12*(4), 525–556.

Beaver, W. H., & Ryan, S. G. (2000). Biases and lags in book value and their effects on the ability of the book-to-market ratio to predict book return on equity. *Journal of Accounting Research*, *38*(1), 127–148.

Beidleman, C. R. (1973). Income smoothing: The role of management. *The Accounting Review*, *48*(4), 653–667.

Bhattacharya, N., Ecker, F., Olsson, P., & Schipper, K. (2012). Direct and mediated associations among earnings quality, information asymmetry, and the cost of equity. *The Accounting Review*, *87*(2), 449–482.

Bhattacharya, U., Daouk, H., & Welker, M. (2003). The world price of earnings opacity. *The Accounting Review*, *78*(3), 641–678.

Biddle, G. C., & Hilary, G. (2006). Accounting Quality and Firm-Level Capital Investment. *The Accounting Review*, *81*(5), 963–982.

Boterenbrood, R. (2014). Income smoothing by Dutch hospitals. *Journal of Accounting and Public Policy*, *33*, 510–524.

Boulton, T. J., Smart, S. B., & Zutter, C. J. (2011). Earnings Quality and International IPO Underpricing. *The Accounting Review*, *86*(2), 483–505.

Brown, L. D., Call, A. C., Clement, M. B., & Sharp, N. Y. (2015). Inside the 'Black Box' of sell-side financial analysts. *Journal of Accounting Research*, *53*(1), 1–47.

Brown, N. C., Pott, C., & Wömpener, A. (2014). The effect of internal control and risk management regulation on earnings quality: Evidence from Germany. *Journal of Accounting and Public Policy*, *33*(1), 1–31.

Burgstahler, D., & Dichev, I. (1997). Earnings management to avoid earnings decreases and losses. *Journal of Accounting & Economics*, *24*(1), 99–126.

Burgstahler, D., Hail, L., & Leuz, C. (2006). The Importance of Reporting Incentives: Earnings Management in European Private and Public Firms. *The Accounting Review*, *81*(5), 983–1016.

Callen, J. L., Segal, D., & Hope, O.-K. (2010). The pricing of conservative accounting and the measurement of conservatism at the firm-year level. *Review of Accounting Studies*, *15*(1), 145–178.

Cano-Rodríguez, M., & Nunez-Nickel, M. (2015). Aggregation bias in estimates of conditional conservatism: Theory and evidence. *Journal of Business Finance and Accounting*, *42*(1–2), 51–78.

Chang, H., Suh, S.-H., Werner, E., & Zhou, J. (2012). The effect of SOX on the predictability of future cash flows in litigious and non-litigious industries. *Asia-*

Pacific Journal of Accounting & Economics, *19*(2), 210–226.

Chen, L. H., Folsom, D. M., Paek, W., & Sami, H. (2014). Accounting conservatism, earnings persistence, and pricing multiples on earnings. *Accounting Horizons*, *28*(2), 233–260.

Clubb, C., & Wu, G. (2014). Earnings volatility and earnings prediction: Analysis and UK evidence. *Journal of Business Finance & Accounting*, *41*(1–2), 53–72.

Dechow, P. (1994). Accounting earnings and cash flows as measures of firm performance. *Journal of Accounting & Economics*, *18*(1), 3–42.

Dechow, P., & Dichev, I. (2002). The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, *77*(Supplement), 35–59.

Dechow, P., & Ge, W. (2006). The persistence of earnings and cash flows and the role of special items: Implications for the accrual anomaly. *Review of Accounting Studies*, *11*(2–3), 253–296.

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting & Economics*, *50*(2/3), 344–401.

Dechow, P., & Skinner, D. J. (2000). Earnings management: Reconciling the views of accounting academics, practitioners, and regulators. *Accounting Horizons*, *14*(2), 235–250.

Dechow, P., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review*, *70*(2), 193–225.

Degeorge, F., Patel, J., & Zeckhauser, R. (1999). Earnings management to exceed thresholds. *The Journal of Business*, *72*(1), 1–33.

Demerjian, P., Lewis, M., Lev, B., & McVay, S. (2013). Managerial ability and earnings quality. *The Accounting Review*, *88*(2), 463–498.

Dietrich, J. R., Muller, K. A., & Riedl, E. J. (2007). Asymmetric timeliness tests of accounting conservatism. *Review of Accounting Studies*, *12*(1), 95–124.

Doupnik, T. S. (2008). Influence of Culture on Earnings Management: A Note. *Abacus*, *44*(3), 317–340.

Durtschi, C., & Easton, P. (2009). Earnings Management? Erroneous Inferences Based on Earnings Frequency Distributions. *Journal of Accounting Research*, *47*(5), 1249–1281.

Ecker, F., Francis, J., Kim, I., Olsson, P., & Schipper, K. (2006). A Returns-Based Representation of Earnings Quality. *The Accounting Review*, *81*(4), 749–780.

Ewert, R., & Wagenhofer, A. (2005). Economic Effects of Tightening Accounting Standards to Restrict Earnings Management. *The Accounting Review*, *80*(4), 1101–1124.

FASB. (1980). Statement of Financial Accounting Concepts. No. 2. Qualitative Characteristics of Accounting Information.

Feltham, G. A., & Ohlson, J. A. (1995). Valuation and clean surplus accounting for operating and financial activities. *Contemporary Accounting Research*, *11*(2), 689.

Fields, T. D., Lys, T. Z., & Vincent, L. (2001). Empirical research on accounting choice. *Journal of Accounting & Economics*, *31*(1–3), 255–307.

Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2004). Costs of Equity and Earnings Attributes. *The Accounting Review*, *79*(4), 967–1010.

Francis, J., Nanda, D., & Olsson, P. (2008). Voluntary disclosure, earnings quality and cost of capital. *Journal of Accounting Research*, *46*(1), 53–99.

Freeman, R. N., Ohlson, J. A., & Penman, S. H. (1982). Book Rate-of-Return and Prediction of Earnings Changes: An Empirical Investigation. *Journal of Accounting Research*, *20*, 639–653.

Gaio, C., & Raposo, C. (2011). Earnings quality and firm valuation: International evidence. *Accounting and Finance*, *51*(2), 467–499.

García Lara, J. M., García Osma, B., & Mora, A. (2005). The Effect of Earnings Management on the Asymmetric Timeliness of Earnings. *Journal of Business Finance & Accounting*, *32*(3/4), 691–726.

García Lara, J. M., García Osma, B., & Penalva, F. (2009). Accounting conservatism and corporate governance. *Review of Accounting Studies*, *14*(1), 161–201.

García Lara, J. M., García Osma, B., & Penalva, F. (2018). *Accounting conservatism and the limits to earnings management*. *Working Paper*.

García Osma, B., Gill de Albornoz Noguer, B., & Gisbert, A. (2005). La investigación sobre Earnings Managements. *Revista Española de Financiación y Contabilidad*, *34*(127), 1001–1033.

Gassen, J., Uwe Fülbier, R., & Sellhorn, T. (2006). International differences in conditional conservatism - The role of unconditional conservatism and income smoothing. *European Accounting Review*, *15*(4), 527–564.

Givoly, D., & Hayn, C. (2000). The changing time-series properties of earnings, cash flows and accruals: Has financial reporting become more conservative? *Journal of Accounting & Economics*, *29*(3), 287–320.

Givoly, D., Hayn, C., & Natarajan, A. (2007). Measuring reporting conservatism. *The Accounting Review*, *82*(1), 65–106.

Guan, L., & Pourjalali, H. (2010). Effect of Cultural Environmental and Accounting Regulation on Earnings Management: A Multiple Year-Country Analysis. *Asia-Pacific Journal of Accounting & Economics*, *17*, 99–127.

Healy, P. M., Serafeim, G., Srinivasan, S., & Yu, G. (2014). Market competition, earnings management, and persistence in accounting profitability around the world. *Review of Accounting Studies*, *19*, 1281–1308.

Healy, P. M., & Wahlen, J. M. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*, *13*(4), 365–383.

Hermanns, S. (2006). *Financial Information and Earnings Quality: a literature review*.

Holthausen, R. W., & Watts, R. L. (2001). The relevance of the value-relevance literature for financial accounting standard setting. *Journal of Accounting & Economics*, *31*(1–3), 3–75.

Houmes, R. E., & Skantz, T. R. (2010). Highly Valued Equity and Discretionary Accruals. *Journal of Business Finance & Accounting*, *37*(1/2), 60–92.

Huang, X., Teoh, S. H., & Zhang, Y. (2014). Tone management. *The Accounting Review*, *89*(3), 1083–1113.

Imhoff, E. A. (2003). Accounting quality, auditing, and corporate governance. *Accounting Horizons*, *17*, 117–128.

Jackson, S. B. (2008). The effect of firms' depreciation method choice on managers' capital investment decisions. *The Accounting Review*, *83*(2), 351–376.

Jackson, S. B., & Cechinni, M. (2009). Economic consequences of firms' depreciation method choice: evidence from capital investments. *Journal of Accounting and Economics*, *48*(1), 54–68.

Jackson, S. B., & Liu, X. (2010). The Allowance for Uncollectible Accounts, Conservatism, and Earnings Management. *Journal of Accounting Research*, *48*(3), 647–686.

Jones, K. L., Krishnan, G. V, & Melendrez, K. D. (2008). Do Models of Discretionary Accruals Detect Actual Cases of Fraudulent and Restated Earnings? An Empirical Analysis. *Contemporary Accounting Research*, *25*(2), 6.

Jung, B., Lee, W.-J., & Weber, D. P. (2014). Financial reporting quality and labor investment efficiency. *Contemporary Accounting Research*, *31*(4), 1047–1076.

Khan, M., & Watts, R. L. (2009). Estimation and empirical properties of a firm-year-measure of accounting conservatism. *Journal of Accounting & Economics*, *48*, 132–150.

Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting & Economics*, *39*(1), 163–197.

Lee, L., Petter, S., Fayard, D., & Robinson, S. (2011). On the use of partial least squares path modeling in accounting research. *International Journal of Accounting Information Systems*, *12*(4), 305–328.

Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: an international comparison. *Journal of Financial Economics*, *69*(3), 505–527.

Leuz, C., & Wysocki, P. D. (2016). The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research. *Journal of Accounting Research*, *54*(2), 525–622.

McNichols, M. F. (2000). Research design issues in earnings management studies. *Journal of Accounting and Public Policy*, *19*(4,5), 313–345.

Mora, A., & Walker, M. (2015). The Implications of Research on Accounting Conservatism for Accounting Standard Setting. *Accounting & Business Research*, *45*(5), 620–650.

Nelson, M. W., Elliot, J., & Tarpley, R. (2003). How are earnings managed? Examples from auditors. *Accounting Horizons*, *17*, 17–35.

Pae, J. (2007). Unexpected accruals and conditional accounting conservatism. *Journal of Business Finance & Accounting*, *34*(5–6), 681–704.

Patatoukas, P. N., & Thomas, J. K. (2011). More Evidence of Bias in the Differential Timeliness Measure of Conditional Conservatism. *The Accounting Review*, *86*(5), 1765–1793.

Penman, S. H. (2003). The quality of financial statements: Perspectives from the recent stock market bubble. *Accounting Horizons*, *17*, 77–96.

Penman, S. H., & Zhang, X.-J. (2002). Accounting conservatism, the quality of earnings, and stock returns. *The Accounting Review*, *77*(2), 237–264.

Perotti, P., & Wagenhofer, A. (2014). Earnings quality measures and excess returns. *Journal of Business Finance & Accounting*, *41*(5–6), 545–571.

Reinartz, W., Haenlein, M., & Henseler, J. (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of Research in Marketing*, *26*(4), 332–344.

Roychowdhury, S., & Watts, R. L. (2007). Asymmetric timeliness of earnings, market-to-book and conservatism in financial reporting. *Journal of Accounting & Economics*, *44*(1/2), 2–31.

Ruch, G. W., & Taylor, G. (2015). Accounting conservatism: a review of the literature. *Journal of Accounting Literature*, *34*(1), 17–38.

Schipper, K., & Vincent, L. (2003). Earnings quality. *Accounting Horizons*, *17*, 97–110.

Sloan, R. G. (1996). Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review*, *71*, 289–315.

Tabachnick, & Fidell. (2007). *Using multivariate statistics* (5th ed.). Boston, Netherlands, Boston: Allyn & Bacon / Pearson Education.

Thomas, J., & Zhang, X. (2000). Identifying unexpected accruals: A comparison of current approaches. *Journal of Accounting and Public Policy*, *19*(4,5), 347–376.

Tucker, J. W., & Zarowin, P. (2006). Does Income Smoothing Improve Earnings Informativeness? *The Accounting Review*, *81*(1), 251–270.

Ullman, J. B. (2006). Structural Equation Modeling : Reviewing the Basics and Moving Forward. *Journal of Personality Assessment*, *87*(1), 35–50.

VanTendeloo, B., & Vanstraelen, A. (2008). Earnings Management and Audit Quality in Europe: Evidence from the Private Client Segment Market. *European Accounting Review*, *17*(3), 447–469.

Wang, Q., Ettredge, M., Huang, Y., & Sun, L. (2011). Strategic revelation of differences in segment earnings growth. *Journal of Accounting and Public Policy*, *30*(4), 383–392.

Watts, R. L. (2003). Conservatism in accounting part I: Explanations and implications. *Accounting Horizons*, *17*(3), 207–221.

Wilson, M. (2011). Earnings management in Australian corporations. *Australian Accounting Review*, *21*(3), 205–221.

Wittenberg-Moerman, R. (2008). The role of information asymmetry and financial reporting quality in debt trading. *Journal of Accounting & Economics*, *46*, 240–260.

Wold, H. (1980). Model Construction and Evaluation When Theoretical Knowledge is scarce. *Bureau of Economic Research*, 47–74.

Yeo, G. H. H., Tan, P. M. S., Ho, K. W., & Chen, S.-S. (2002). Corporate ownership structure and the informativeness of earnings. *Journal of Business Finance & Accounting*, *29*(7/8), 1023–1046.

Zhang, J. (2008). The contracting benefits of accounting conservatism to lenders and borrowers. *Journal of Accounting and Economics*, *45*(1), 27–54.

APPENDIX A: STATISTICAL PROBLEMS DERIVED FROM ANALYSIS OF UNIDIMENSIONAL MODELS OF EARNINGS QUALITY.

To analyse the problems that can arise when the multidimensional concept of earnings quality is measured using single-property measures, a parsimonious model in which earnings quality depends linearly on two characteristic can be defined, as indicated in expression [A.1]:

$$EQ = \alpha_0 + \alpha_1 \cdot EQ_1 + \alpha_2 \cdot EQ_2 + \varepsilon_1, \qquad [A.1]$$

where EQ is earnings quality, EQ_1 and EQ_2 are the two properties that define it, and ε_1 is the error term. It is assumed that EQ_1 and EQ_2 are directly observable, but not the composite measure EQ.

Following Dechow et al. (2010), we study the potential problems of using single-property proxies of earnings quality in two cases: When earnings quality is an explanatory variable (consequences of earnings quality) and when it is the explained variable (determinants of earnings quality).

EARNINGS QUALITY AS THE EXPLANATORY VARIABLE.

Let us assume a linear relationship between any given variable Y and earnings quality (EQ), as indicated in equation [A.2]:

$$Y = \beta_0 + \beta_1 \cdot EQ + \varepsilon_2. \qquad [A.2]$$

Substituting [A.1] in [A.2] provides the relationship between the dependent variable Y and the two earnings-quality characteristics:

$$Y = \beta_0 + \beta_1 \cdot (\alpha_0 + \alpha_1 \cdot EQ_1 + \alpha_2 \cdot EQ_2 + \varepsilon_1) + \varepsilon_2 = (\beta_0 + \beta_1 \cdot \alpha_0) + (\beta_1 \cdot \alpha_1) \cdot EQ_1 + (\beta_1 \cdot \alpha_2) \cdot EQ_2 + (\beta_1 \cdot \varepsilon_1 + \varepsilon_2). \qquad [A.3]$$

Let consider that EQ is not observable, so the researcher tries to capture the relationship between Y and EQ by analysing the relationship between Y and one of the two components of EQ (for instance, EQ1). The empirical model to be tested would then be:

$$Y = b_0 + b_1 \cdot EQ_1 + \varepsilon_3. \qquad [A.4]$$

The probability limit of coefficient b_1 would be:

$$plim\, b_1 = \frac{Cov(Y, EQ_1)}{Var(EQ_1)}, \qquad [A.5]$$

where *Cov(.)* and *Var(.)* are the covariance and variance operators, respectively. Substituting Y by its value according to equation [A.3] and operating, we get:

$$plim\, b_1 = \frac{Cov[(\beta_0 + \beta_1 \cdot \alpha_0) + (\beta_1 \cdot \alpha_1) \cdot EQ_1 + (\beta_1 \cdot \alpha_2) \cdot EQ_2 + (\beta_1 \cdot \varepsilon_1 + \varepsilon_2), EQ_1]}{Var(EQ_1)} = (\beta_1 \cdot \alpha_1) + (\beta_1 \cdot \alpha_2) \cdot \frac{Cov(EQ_1, EQ_2)}{Var(EQ_1)}. \qquad [A.6]$$

By replacing *EQ* by EQ_1, the researcher incurs in an error-in-variables problem, and the estimated coefficient b_1 measures the relationship between the dependent variable *Y* and *EQ* (β_1) with a bias. The value of this bias would be

$$plim\, b_1 = (\beta_1 \cdot \alpha_1) + (\beta_1 \cdot \alpha_2) \cdot \frac{Cov(EQ_1, EQ_2)}{Var(EQ_1)}$$
$$= \beta_1 \cdot \left[\alpha_1 + \alpha_2 \cdot \frac{Cov(EQ_1, EQ_2)}{Var(EQ_1)}\right] \qquad [A.7]$$
$$= \beta_1 + \beta_1 \cdot \left[\alpha_1 + \alpha_2 \cdot \frac{Cov(EQ_1, EQ_2)}{Var(EQ_1)} - 1\right] = \beta_1 + \theta_1.$$

Bias θ_1 depends on the value of coefficients β_1, α_1, and α_2 and the value of the regression coefficient of EQ_2 on EQ_1. This bias would be equal to 0 (and the estimated coefficient b_1 would therefore capture the true relationship between *EQ* and *Y*) if one of two conditions is met.

(1) α_2=0 and α_1=1. In this case, *EQ* would be exactly equal to EQ_1, eliminating any error-in-variables problem. In that case, though, earnings quality would not be multidimensional.

(2) $\frac{\text{Cov}(\text{EQ}_1,\text{EQ}_2)}{\text{Var}(\text{EQ}_1)} = \frac{1-\alpha_1}{\alpha_2}$. As far as can be determined, there is no a priori reason for this equality to be fulfilled.

In summary, except under extremely restrictive conditions, the empirically estimated coefficient b_1 will measure the relationship between earnings quality and the dependent variable with error.

It is possible, however, that the aim of the researcher is not to measure the influence of earnings quality on the dependent variable *Y* (β_1), but the influence of that specific earnings-quality component on that variable. According to equation [A.3], that influence would be $\beta_1 \cdot \alpha_1$. In this case, the empirical coefficient b_1 also captures the relationship between *Y* and EQ_1 with a bias:

$$plim\, b_1 = (\beta_1 \cdot \alpha_1) + (\beta_1 \cdot \alpha_2) \cdot \frac{Cov(EQ_1, EQ_2)}{Var(EQ_1)} = (\beta_1 \cdot \alpha_1) + \theta_2. \qquad [A.8]$$

θ_2 is an omitted-variables bias, and it depends on the influence of the second component EQ_2 on the dependent variable Y, and on the relationship between the two earnings-quality components. For θ_2 to be equal to 0, one of the two following conditions must be met:

(1) α_2=0: no relationship between EQ_2 and Y.

(2) $\mathrm{Cov}(\mathrm{EQ}_1, \mathrm{EQ}_2) = 0$: EQ_1 and EQ_2 are independent. This condition, however, is not likely to be met because, as documented in the previous section, the extant literature has widely demonstrated the existence of non-zero correlations among the different components of earnings quality.

EARNINGS QUALITY AS THE EXPLAINED VARIABLE.

Assume that earnings quality (*EQ*) is determined by a given variable *X*, as shown in equation [A.9]:

$$EQ = \gamma_0 + \gamma_1 \cdot X + \varepsilon_4. \qquad [A.9]$$

Also assume that *EQ* is replaced by the component EQ_1 in the empirical model, which would then be:

$$EQ_1 = c_0 + c_1 \cdot X + \varepsilon_5. \qquad [A.10]$$

The empirically estimated coefficient c_1 would converge in probability to:

$$plim\ c_1 = \frac{Cov(EQ_1, X)}{Var(X)}. \qquad [A.11]$$

From equation [A.1], EQ_1 can be expressed as a function of *EQ* and EQ_2 as

$$EQ_1 = \frac{EQ - \alpha_0 - \alpha_2 \cdot EQ_2 - \varepsilon_1}{\alpha_1}. \quad [A.12]$$

Substituting [A.12] in [A.11] and operating:

$$plim\, c_1 = \frac{1}{\alpha_1} \cdot \frac{Cov(EQ, X)}{Var(X)} - \frac{\alpha_2}{\alpha_1} \cdot \frac{Cov(EQ_2, X)}{Var(X)} = \frac{1}{\alpha_1} \cdot \gamma_1 - \frac{\alpha_2}{\alpha_1} \cdot \frac{Cov(EQ_2, X)}{Var(X)}. \quad [A.13]$$

The estimated coefficient c_1 captures the relationship between earnings quality and the explanatory variable X with a bias, expressed as

$$plim\, c_1 = \gamma_1 + \left(\frac{1}{\alpha_1} - 1\right) \cdot \gamma_1 - \frac{\alpha_2}{\alpha_1} \cdot \frac{Cov(EQ_2, X)}{Var(X)} = \gamma_1 + \theta_3. \quad [A.14]$$

For the bias θ_3 to be 0, the following condition must be met:

$$\frac{Cov(EQ_2, X)}{Var(X)} = \frac{1 - \alpha_1}{\alpha_2} \cdot \gamma_1$$

There appears to be no a priori reason for that condition to be met. In conclusion, the replacement of the composite concept EQ by one of its components implies that the estimated coefficient c_1 will likely capture the influence of X on earnings quality with a bias.

APPENDIX B: STATISTICAL PROBLEMS DERIVED FROM ANALYSIS OF COMPOSITE MEASURES OF EARNINGS QUALITY.

Let consider that a researcher measures *EQ* by a composite index, composed by the addition of the percentile ranking of the observed values of EQ_1 and EQ_2. This model can be expressed as in equation [B.1]:

$$EQ\_IND = RankEQ_1 + RankEQ_2, \qquad [B.1]$$

where *EQ_IND is* the composite measure of earnings quality, and $RankEQ_1$ and $RankEQ_2$ are the percentile rankings of the two observable characteristics EQ_1 and EQ_2. *EQ_IND* would then measure *EQ* with an error:

$$EQ_{IND} = EQ + \varepsilon_6. \qquad [B.2]$$

Assume that the researcher intends to study the relationship between a variable *Y* and earnings quality (*EQ*). The linear relationship between these two variables is indicated in equation [B.3]:

$$Y = \delta_0 + \delta_1 \cdot EQ + \varepsilon_7. \qquad [B.3]$$

The researcher measures *EQ* with the aggregate index *EQ_IND*, so the empirical model that will be tested is

$$Y = d_0 + d_1 \cdot EQ\_IND + \varepsilon_8. \qquad [B.4]$$

The probability limit of d_1 would then be

$$plim\ d_1 = \frac{Cov(Y, EQ\_IND)}{Var(EQ\_IND)} = \frac{Cov(\delta_0 + \delta_1 \cdot EQ + \varepsilon_7, EQ\_IND)}{Var(EQ\_IND)}$$
$$= \delta_1 \cdot \frac{Cov(EQ, EQ_{IND})}{Var(EQ_{IND})}. \qquad [B.5]$$

The estimated coefficient d_1 captures the relationship of the explained variable *Y* and the composite measure of earnings quality *EQ_IND* with a bias:

$$plim\ d_1 = \delta_1 + \delta_1 \cdot \left(\frac{Cov(EQ, EQ\_IND)}{Var(EQ\_IND)} - 1 \right) = \delta_1 + \theta_4. \qquad [B.6]$$

For bias θ_4 to be 0, one of the two following conditions must be met:

(1) δ_1= 0 (*EQ* does not explain *Y*), or

(2) the regression coefficient of earnings quality on the empirical index is exactly equal to 1.

Thus, except under extremely restrictive conditions, the replacement of *EQ* by a ranking index implies that the estimated coefficient d_1 will capture the influence of earnings quality on *Y* with a bias.

In order to analyse in greater depth, the formation of θ_4, an equation [B.5] can be expressed as

$$plim\ d_1 = \delta_1 \cdot r(EQ, EQ\_IND) \frac{sd(EQ)}{sd(EQ\_IND)}, \qquad [B.7]$$

where *r(.)* is the correlation coefficient, and *sd(.)* is the standard deviation operator.

In summary, we can conclude:

(1) Given that the correlation between a variable and its categorized values is expected to be positive, the sign of d_1 will be the same as the sign of δ_1.

(2) The value of the estimated coefficient d_1 will differ from the theoretical coefficient δ_1, and this difference is dependent on two factors: (a) a correlation factor, which is determined by the correlation between the theoretical variable *EQ* and the categorized variable *EQ_IND*; and (b) a scale factor, determined by the ratio of the variances of the two variables.

The correlation factor depends on such aspects of the internal structure of *EQ* as the coefficients of the different properties (α_1 and α_2), the correlation among those properties, or the number of categories generated for *EQ_IND*. On the other hand, the scale factor is influenced not only by those aspects that also affect the correlation among the properties, but also by the standard deviations of earnings properties (EQ_1 and EQ_2).

Given that the scale factor depends on the various deviations of the theoretical variable *EQ* and the empirical variable *EQ_IND*, it could be mitigated by using standardized regression coefficients, a solution that would not affect the correlation factor.

A simulation procedure was used to analyse the effect of the correlation among the earnings properties on θ_4, following five steps:

(1) 100,000 random observations were generated for variables EQ_1 and EQ_2, following a normal distribution. The simulation process was repeated 19 times to check the influence of the correlation between these two variables. The correlation for the first simulation was set at –0.9, and increased in stages by +0.1 for the successive simulations; the correlation for the last simulation was thus +0.9.

(2) *EQ* was computed by the average of the simulated values of EQ_1 and EQ_2 ($\alpha_1 = \alpha_2 = 0.5$).

(3) By categorizing EQ_1 and EQ_2 by their deciles, the variables $Rank\_EQ_1$ and $Rank\_EQ_2$ were created. Composite earnings-quality measure *Rank_EQ* was then

computed as the average of $Rank\_EQ_1$ and $Rank\_EQ_2$. To avoid the influence of the scale, $Rank\_EQ$ was standardized.

(4) The explained variable $Y = 0.5 \cdot EQ + \omega$, was generated, where ω is a white noise variable.

(5) Finally, the regression coefficient of Y on $Rank\_EQ$ was estimated. The difference between that regression coefficient and the real relationship between Y and EQ (that is, 0.5) is the bias introduced by the earnings-quality index. To isolate the effect of the correlation factor, the standardized regression coefficients were also computed.

The analysis of the simulation indicates that the empirical coefficient d_1 is always smaller than δ_1. This difference decreases as the correlation between the earnings properties increases. In addition, the relationship between the empirical and the theoretical coefficients is much larger when those coefficients are not standardized, showing that the scale factor is the main driver of the potential bias. Consequently, these indices may be a reasonable method for measuring multidimensional earnings quality, but only if standardized coefficients are considered. In any case, some bias will persist even if the standardized coefficients are used, given that the correlation factor would not be eliminated.

CHAPTER 3

Methodology: A proposal for earnings quality conceptualization

CHAPTER 3. METHODOLOGY. A PROPOSAL FOR EARNINGS QUALITY CONCEPTUALIZATION.

3.0. INTRODUCTION TO CHAPTER 3.

In the previous Chapter, we have reviewed the state of the research on earnings quality measurement, concluding that there is an important gap when empirically analysing it because of a generally unidimensional scope that is contradictory with the theoretical multidimensionality of earnings quality. Additionally, the Chapter concluded with the suggestion of the application of new statistical techniques that may be more suitable for earnings quality measurement. Consistent with this idea, some recent papers argue that empirical archival research in accounting can benefit from the use of more advanced techniques, in particular, Structural Equation Modelling (SEM) (Gow, Larcker, & Reiss, 2016; Hinson & Utke, 2018; Larcker & Rusticus, 2010; Leuz et al., 2003). SEM is a set of statistical techniques used to study the relationships between one or more independent variables and one or more dependent variables, both of which can be directly observed or latent variables[6] (Ullman, 2006). Thus, structural equation models are less restrictive than regression models, as they allow the use of multiple predictors and criterion variables, latent (unobservable variables), model error in measurement for observed variables, and test mediation and moderation relationships in a single model (Nitzl, 2016). These advantages have contributed to the popularization of SEM in several fields of research in social sciences, such as psychology, strategic management, management information systems or marketing (Hair et al., 2013; Lee et al., 2011; Sarstedt et al., 2014), as well as in management accounting or behavioural accounting (Hampton, 2015; Lee et al., 2011). Despite of this wide use of SEM in other disciplines, it has not been broadly applied in archival accounting research (Hinson & Utke, 2018; Lee et al., 2011). Blanthorne et al. (2006) indicate that this underutilization of SEM may be attributed to the fact that SEM is a relatively recent complex technique,

[6] In this doctoral research study, we will use the terms “latent variables” and “constructs” indistinctly.

and that guidance on conducting research using SEM is distributed among a large number of papers published in multiple and varied sources. Therefore, many researchers may be unaware of the benefits of SEM over traditional methods.

The aim of this methodological Chapter in the doctoral research study is to offer a guidance for the application of SEM –and, particularly, the Partial Least Squares (PLS) method– to archival accounting research. In particular, we apply this method to our topic of research, earnings quality, which is the (arguably) most recurrent topic on archival accounting research. We start with a revision of the conceptualization process applied to earnings quality. Conceptualization is the process by which the researcher specifies the exact meaning of the conceptual variables of the model (in our case, earnings quality) by describing the different dimensions of that variable and the indicators that can be used to measure it (Babbie, 2017), as well as the relationship between the conceptual variable and those dimensions and indicators. This description constitutes an auxiliary theory that links the theoretical model with the real world (Edwards & Bagozzi, 2000).

The first step in conceptualization is the definition of the theoretical model. Regarding earnings quality, it is difficult to find a unique and explicit, generally accepted definition of the concept (Chaney, Cooil, & Jeter, 2008; Hermanns, 2006). Researchers on this topic typically define a list of dimensions associated to earnings quality in terms of greater usefulness of accounting information (Dechow et al., 2010; Ewert & Wagenhofer, 2011; Hermanns, 2006; Perotti & Wagenhofer, 2014) but not a general concept of earnings quality. The lack of a unique concept leads to several problems. Firstly, there is no a clear consensus about the content of the list of characteristics defining earnings quality. Secondly, such list is likely to be different depending on the user of accounting information (Dechow et al., 2010). Thirdly, characteristics may not be representing really different dimensions of earnings quality. Finally, the relationship between such characteristics and earnings quality is not clear.

The second step is the determination of the relationships between the construct object of study and its dimensions. Dechow et al. (2010) propose a classification of the dimensions of earnings quality intro three groups: earnings quality properties, investors' reactions to earnings quality, and other external indicators of earnings quality. Starting from Dechow et al.'s (2010) classification, we argue that the different types of indicators can be related to the earnings quality construct in two different ways: Earnings properties are related to the earnings quality concept in a formative way, whereas investors' reactions and other external indicators relate to earnings quality in a reflective way. We also discuss the implications of these two different forms of relationships for empirical research.

The last step is the empirical representation of theoretical variables through their indicators (proxies). Applied to earnings quality, when measuring its representative dimensions previous research has employed a large number of proxies (empirical indicators), what makes complicated to determine which one best measures each dimension. This large diversity makes it very difficult to interpret the empirical results because it is not clear whether all these metrics are actually representing a single or different concepts, or whether they are substitutes or complements (Ewert & Wagenhofer, 2011). Considering the different approaches for measuring earnings quality, single-dimension studies assume that only one dimension is directly linked to earnings quality and that it is the only one that is representative of it. Prior literature has questioned the validity of this approach, considering it a limited one to represent earnings quality (Gaio & Raposo, 2011). On the other hand, multidimensional measures have been criticized because of the subjectivity in the selection of the proxies and their weights or because of the lack of analyses on the relationship among the different proxies (Leuz & Wysocki, 2016).

In short, the conceptualization process for the measurement of earnings quality highlights the existence of several problems. The use of alternative techniques such as SEM in general, and PLS in particular, can help to overcome those problems.

For a better assessment of the use of PLS over the traditional methods, we run a simulation process for comparing the performance of PLS with the three approaches more commonly used for measuring earnings quality: single indicator, equally-weighted index, and common factor scores from a factorial analysis. The results show that PLS typically outperforms the other approaches, even in scenarios with poor information. Henceforth, we propose a research design for earnings quality measurement with PLS, which is expected to improve its estimation.

This Chapter is structured as follows. In section 3.1, we present an overview of structural equation modelling techniques, comparing the two most common methods: covariance-based SEM and variance-based SEM or PLS. Then, in section 3.2, we expose a framework for measuring earnings quality, highlighting its main problems, and analysing how the empirical extant research have dealt with them. In section 3.3, we design a simulation process to compare the estimation errors of the PLS approach with the traditional methods employed in empirical research on earnings quality. Finally, section 3.4 concludes.

3.1. AN OVERVIEW OF STRUCTURAL EQUATION MODELLING TECHNIQUES.

Structural Equation Modelling (SEM) is a methodology that brings together psychometric and econometric analyses, exploiting the best features of both (Fornell & Larcker, 1981). This way, the analysis of behaviour and relationships of variables is not restricted to observed variables (econometric analysis) as in regression, but also to non-directly observed ones (psychometric analysis) (Becker, Rai, & Rigdon, 2013; Fornell & Larcker, 1981; Nitzl, 2016; Rigdon, 2016). In other words, in SEM estimation models both dependent and independent variables can be either directly-observed variables or latent variables, which are those that are not directly observed but inferred from directly-observable indicators in datasets (Gefen et al., 2011; Henri, 2007; Rigdon, 2016; Tenenhaus, Vinzi, Chatelin, & Lauro, 2005; Ullman, 2006). Intentions, subjective norms for specific decision-making process, or attitudes are typical examples of variables that can be estimated with SEM because of such incorporation of the psychological process in the model (Nitzl, 2016). All these things together, the use of non-directly observable (latent) variables makes SEM suitable for many topics in empirical accounting that deal with complex, theoretical concepts that cannot be directly observed, as it would be the case of earnings empirical archival accounting research.

SEM evaluates in a single and comprehensive analysis two levels of relationships: The measurement model –relationship between the latent variables and their empirical indicators– and the structural model –relationships among the different latent variables (Gefen et al., 2011; Roldán & Sánchez-Franco, 2012; Tenenhaus et al., 2005). Figure 2, taken by Cepeda and Roldán (2013) shows a graphical example of these two levels.

FIGURE 2. GENERAL STRUCTURAL MODEL EQUATION (SEM) DESIGN.

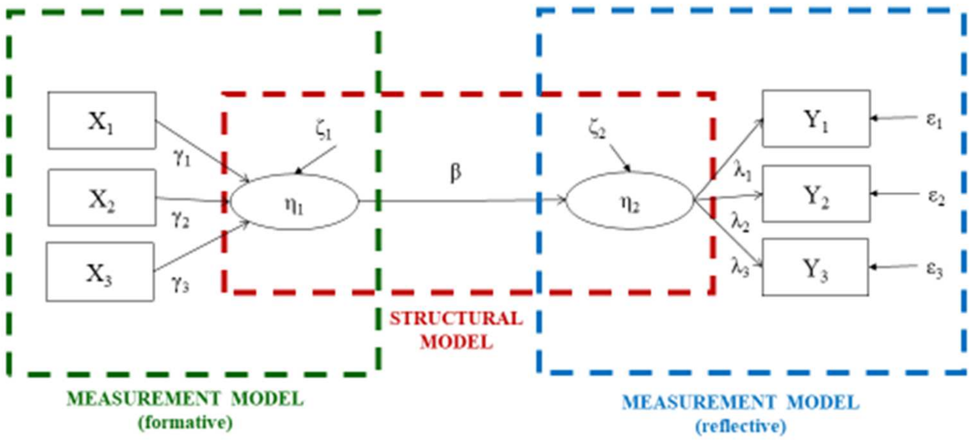


Figure 2 shows a general design of Structural Equation Models, both the measurement model and the structural model, adapted from Cepeda and Roldán (Cepeda & Roldán, 2013). The circles represent non-directly observable (latent) variables and the rectangles represent the observable indicators from which the latent variable is inferred. We have a structural model in which a latent variable, η_1 produces an effect on another latent variable, η_2. Similarly, we have two measurement models, one for each latent variable η. In the first model, η_1 presents a formative relationship with observable variables X_1, X_2 and X_3; then, η_1 would be calculated as the lineal combination of the three observable variables X_1, X_2, and X_3, and the gamma parameters γ_1, γ_2, and γ_3, existing a measurement error of ζ_1. Latent variable η_2 is measured reflectively using the three observable variables Y_1, Y_2, and Y_3, which have loadings of λ_1, λ_2, and λ_3, existing a measurement error of ζ_2.

The main feature of SEM, and what makes it advantageous against other techniques, is the integration of measurement and hypothesized causal paths into a simultaneous assessment (Dijkstra & Henseler, 2015; Gefen et al., 2011; Hinson & Utke, 2018; Rigdon, 2012; Ullman, 2006), presenting the results as a whole (Gefen et al., 2011; Gefen, Straub, & Boudreau, 2000). Moreover, it allows for modelization of complex, complete theories with multiple relationships (Davick, 2014; Hair et al., 2013; Ringle, Sarstedt, & Schlittgen, 2014), that can be defined both in the measurement model and the structural model (Henri, 2007; Henseler & Sarstedt, 2013; Hinson & Utke, 2018; Rönkkö & Evermann, 2013; Tenenhaus et al., 2005).

There are two main SEM techniques: covariance-based method (CB-SEM), and variance-based method or Partial Least Squares (PLS). These two methods differ in the objective of analysis, statistical supporting, type of relationships among variables and the nature of statistics for goodness of fit, being therefore complementary rather than competitive (Gefen et al., 2000; Hair et al., 2011, 2012; Henseler et al., 2012; Sarstedt et al., 2014; Wold, 1982).

Regarding the objective of analysis, covariance-based models try to confirm a given theory by explaining the covariance matrix among the items (Davick, 2014; Gefen et al., 2011; Hair et al., 2011; Hair, Tomas, Hult, Ringle, & Sarstedt, 2016; Henseler et al., 2012, 2009), whereas variance-based models try to maximize the portion of variance of dependent variables explained by independent variables (Davick, 2014; Gefen et al., 2000; Hair, Sarstedt, Ringle, & Gudergan, 2017; Henseler et al., 2012; Henseler & Sarstedt, 2013; Mateos-Aparicio, 2011; Roldán & Sánchez-Franco, 2012). CB-SEM is, therefore, a suitable technique for theory confirmation, but it is a limited approach for predictive analysis, because there is an infinite number of possible latent variable scores that fit the model (Becker et al., 2013; Davick, 2014; Gefen et al., 2011; Hair et al., 2017, 2016; Mateos-Aparicio, 2011; Rigdon, 2012; Wold, 1985). PLS method, on the other hand, produces a single specific value for each composite (variable) for each case (Becker et al., 2013; Hair et al., 2011, 2016), making this method more suitable for predictive purposes, although it can also be used for confirmatory analysis (Gefen et al., 2011, 2000; Henseler & Sarstedt, 2013).

About statistical supporting, a properly defined and estimated CB-SEM model requires a strong set of conditions, being a hard modelling technique (Mateos-Aparicio, 2011; Tenenhaus et al., 2005). Thus, requirements about the development of the theory, the distribution of the variables, sample size, or complexity of the model can impair the application of this technique. Additionally, model misspecifications –even in a subpart of the model– has a detrimental effect on the whole model (Henseler et al., 2014, 2012). PLS requirements, on the other hand, are softer, as it assumes that the latent variables can be measured with error (Davick, 2014; Reinartz et al., 2009) and it is not necessary to know the exact behaviour and structure of the measurement error in all variables (Gefen et al., 2011). PLS is therefore considered a limited-information approach because it can correctly estimate even if the model is misspecified in any of its subparts and hence, useful for analysing initially formulated but misspecified models (Henseler et al., 2014; Reinartz et al., 2009). PLS is also less restrictive in terms of data requirements because it yields appropriate estimations even with small sample size or absent normality-distribution assumptions (Gefen et al., 2011, 2000, Hair et al., 2011, 2016; Henseler et al., 2012; Reinartz et al., 2009; Roldán & Sánchez-Franco, 2012; Sarstedt et al., 2014; Wold, 1980) and it does not require, as in CB-SEM, a minimum number of indicators for each variable to ensure model identification (Henseler et al., 2014; Reinartz et al., 2009).

Regarding the different ways of relationships between the variables, CB-SEM is suitable for reflective but not for formative[7] relationships between the variables (Gefen et al., 2011, 2000; Henseler et al., 2012), which have been proved to show identification problems (Henseler et al., 2012, 2009). On the other hand, PLS is suitable and, therefore, preferable to CB-SEM in formative constructs (Henseler et al., 2012; Henseler & Sarstedt, 2013). Actually, the ability to work with formative constructs is one of the most commonly reasons to choose PLS over CB-SEM for researchers (Hair et al., 2012; Nitzl, 2016; Ringle, Sarstedt, & Straub, 2012).

Finally, with respect to the goodness of fit, CB-SEM confirms the similarity between the theoretical covariance matrix of the whole model and the real one, optimizing a global scalar function (Gefen et al., 2000; Henseler & Sarstedt, 2013). For that reason, CB-SEM yields some statistics for the analysis of global goodness of fit (Dijkstra & Henseler, 2015; Fornell & Larcker, 1981; Gefen et al., 2011, 2000; Henseler & Sarstedt, 2013; Rigdon, 2012; Tenenhaus et al., 2005). PLS, on the other hand, lacks of a global scalar function and hence, there is no a global measure for goodness of fit (Hair et al., 2013; Henseler & Sarstedt, 2013; Rigdon, 2012, 2014; Tenenhaus et al., 2005), although there are alternative relative tests or distance tests in PLS to evaluate the goodness of estimated coefficients (Dijkstra & Henseler, 2015;

[7] In brief, reflective relationships are those where the indicators are considered as error-prone manifestations of the latent variable, that is to say, variations in the indicators' measures are considered consequences of the latent variable. In formative relationships, the indicators cause the variations in the latent variable. We will review these relationships in more detail later.

Henseler et al., 2014) and future research lines should try to develop new tests for testing goodness of fit (Rigdon, 2014).

In summary, the selection of CB-SEM or PLS should depend on the suitability of assumptions and objectives of SEM approach with research (Roldán & Sánchez-Franco, 2012). Taken into account the different characteristics that have been previously explained, in this doctoral research we focus on the application of variance-based model (PLS) to archival empirical accounting research, because of its softer requirements and the possibility of using formative approaches. For a better understanding of the advantages of using PLS, we will describe its application to the research on our specific research topic (earnings quality), showing how this technique can solve several problems for the measuring of this concept.

3.2. AN EVALUATION OF THE EXTANT RESEARCH ON EARNINGS QUALITY.

Earnings quality is perhaps the most common topic in accounting research, as documented by various papers that have reviewed the research on this issue (Dechow et al., 2010; Dechow & Schrand, 2004; Francis, Olsson, & Schipper, 2006; Schipper & Vincent, 2003). Despite this vast research on the topic, the term “earnings quality” is in a current state of “ambiguity” (Dechow et al., 2010). This ambiguity may have been caused because authors have employed a wide range of empirical measures that are expected to represent some desirable characteristic of earnings[8], and it may justify the existence of the mixed evidence on the causes and consequences of earnings quality.

In Chapter 2, the main approaches in extant literature for measuring earnings quality were reviewed, concluding that neither unidimensional (single-property studies) nor multidimensional (rankings and common factor aggregated measures) are

[8] Some examples of these characteristics are (the absence of) abnormal accruals, the absence of discontinuities in the cross-sectional distribution of earnings, the predictability or the smoothness of reported earnings, the value relevance of earnings or book values, the degree of accounting conservatism, investors’ reactions to reported earnings, or the opinion of external parties

appropriate, for they are likely to render biased estimations of earnings quality parameters. We concluded the Chapter indicating the potential suitability of PLS for earnings quality measurement. More in details, in this section of Chapter 3, we undertake the description of a framework for measuring earnings quality, highlighting the main problems that arise in its measurement, how the extant research has dealt with those problems, and how the application of PLS can help to overcome them.

3.2.1. A Framework for Measuring Earnings Quality.

On broad terms, the goal of theory-based empirical research on Social Sciences is to test the adequacy of a theoretical model to the real world. To achieve this goal, empirical researchers follow a process that covers two different levels (Babbie, 2017; Bisbe, Batista-Foguet, & Chenhall, 2007): the conceptual specification level and the operational level.

In the conceptual specification level, the theoretical model is defined. Theoretical models are sets of relationships among different conceptual variables that formalize the key elements of a theory (Bollen, 2002). This level starts with the conceptualization process, in which the researcher identifies and specifies the exact meaning of the conceptual variables of interest[9]. This process also involves the description of the different aspects of the concept, known as dimensions, as well as the indicators that will be used to measure the concept (Babbie, 2017; Bisbe et al., 2007; Edwards & Bagozzi, 2000). Subsequently, the set of relationships among the conceptual variables that forms the model will be determined (Bisbe et al., 2007).

In the operational level, the researcher develops the specific procedures that will result in empirical observations that represent the conceptual variables in the real world (Babbie, 2017). Finally, by analysing the relationships among the empirical observations that represent the conceptual variables, the researcher indirectly tests the

[9] We define conceptual variables as the representation of ideas or abstract concepts that researchers establish to design the models (Sarstedt et al., 2016).

extent to which the theoretical model is consistent with the real world (Bisbe et al., 2007).

This process can be represented using Libby et al.'s predictive validity framework (Libby, Bloomfield, & Nelson, 2002) shown in Figure 3. At the conceptual level, the researcher defines the conceptual variables (boxes A and B) and develops the model that relates them (link 1). At the operational level, the researcher specifies how the conceptual variables are to be operationalized (boxes C and D, and links 2 and 3). Finally, the relationship between the operationalized variables is assessed (link 4), as a representation of the theoretical relationship between the conceptual variables (link 1).

FIGURE 3. PREDICTIVE VALIDITY FRAMEWORK.

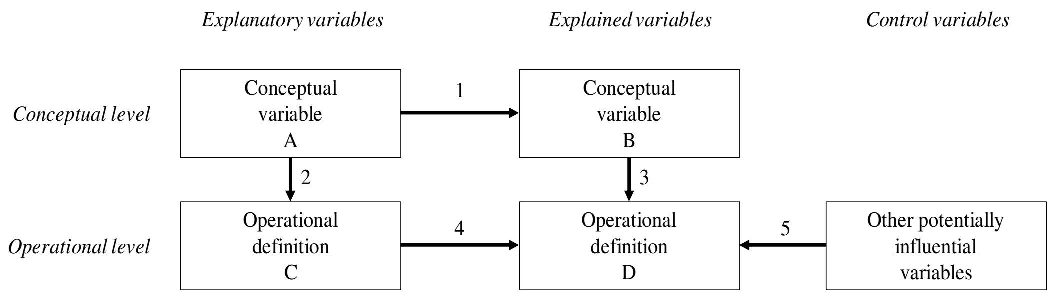


Figure 3 represents the process followed to test the adequacy of a theoretical model in reflecting the real world, taken from Libby et al. (2002). At the conceptual level, the researcher defines the conceptual variables (boxes A and B) and their relationship (link 1). At the operational level, the conceptual variables are specified (boxes C and D and links 2 and 3). The relationship among the operationalized variables (link 4) is considered a representation of the relationship among the conceptual variables (link 1).

Next, we are going to apply this process to the measurement of earnings quality.

3.2.1.1. Earnings Quality Conceptualization

Research on earnings quality should start at the conceptual specification level with the definition of the theoretical model. According to Dechow et al. (2010), the typical research study on earnings quality analyses either the causes of earnings quality (earnings quality is the dependent variable) or the consequences of earnings quality (earnings quality is the independent variable). The researcher should, then, determine the relationships among the variables of interest according to the theory to be tested. For the sake of simplicity, we will consider an example in which earnings quality is the cause of some dependent variable.

In addition to the specification of the relationships among the variables of interest, the researcher has to proceed to the conceptualization of those variables, that is to say, the specification of its exact meaning and the description of its dimensions (Babbie, 2017). We will focus on the specific conceptualization of earnings quality, that is, the explanatory variable, and we will not discuss the conceptualization of the dependent variable.

Despite the vast literature on this topic, it is difficult to find a unique and explicit, generally accepted definition of earnings quality concept (Chaney et al., 2008; Hermanns, 2006). Neither the Financial Accounting Standards Board (FASB) nor the International Accounting Standard Board (IASB) provides a formal definition of earnings quality within their conceptual frameworks, although they provide a list of qualitative characteristics that are expected to increase the utility of financial information, such as relevance, faithful representation, comparability, verifiability, timeliness, and understandability (IASB, 2010). Consistent with this approach, empirical researchers have defined several earnings characteristics or dimensions that are associated to earnings quality because they are expected to increase the usefulness of accounting information for decision making (Dechow et al., 2010; Ewert & Wagenhofer, 2011; Hermanns, 2006; Perotti & Wagenhofer, 2014; Schipper & Vincent, 2003). Table 4 reports various papers that have reported a list of the different dimensions of earnings quality.

The first conclusion that can be extracted is that there is no clear agreement about the content of the list of characteristics that define earnings quality. As it can be seen on Table 1, some papers consider only a few characteristics (Chaney et al., 2008; Ewert & Wagenhofer, 2011; Laksmana & Yang, 2009; Perotti & Wagenhofer, 2014) while others include a considerably larger list (Dechow et al., 2010; Dechow & Schrand, 2004; Hermanns, 2006; Schipper & Vincent, 2003). Besides, some dimensions (e.g. persistence, smoothing or accruals quality) are considered in most of the papers, while others (e.g. conservatism, investor responsiveness, value relevance, judgements of experts) are mentioned in just a few papers. This huge variety of earnings quality metrics would not be an issue if the correlations among them were high, thereby indicating that all those metrics are measuring (with error) the same underlying construct. Dechow et al (2010), however, analysed the convergent validity of various earnings quality metrics, concluding that they are not representing one single construct, but measuring different dimensions.

TABLE 4. THE DIMENSIONS OF EARNINGS QUALITY IN PRIOR LITERATURE

ARTICLES	DIMENSIONS OF EARNINGS QUALITY
Schipper and Vincent (2003)	Persistence, predictability, variability, abnormal or discretionary accruals, association of accruals and cash flows, comparability, decision usefulness (relevance), estimates and judgements of experts.
Dechow and Schrand (2004)	Persistence, association of accruals and cash flows, earnings management, conservative accounting, investor response to earnings (ERC), relevance, audit opinion, voluntary disclosure, forecast accuracy.
Francis et al. (2004)	Accruals quality, smoothness, persistence, predictability, conservatism, timeliness, value relevance
Barth et al. (2008)	Earnings management (smoothing and target beating), timely loss recognition, value relevance
Chaney et al. (2008)	Persistence, predictability, smoothness, accruals variability, conservatism
Laksmana and Yang (2009)	Persistence, predictability, smoothness, accruals quality
Dechow et al. (2010)	Accruals quality, smoothness, persistence, conservatism, investor responsiveness, other indicators of earnings misstatements
Ewert and Wagenhofer (2011)	Persistence, predictability, smoothness, accruals quality, value relevance
Gaio and Raposo (2011)	Accruals quality, smoothness, persistence, predictability, conservatism, timeliness, value relevance
Demerjian et al. (2013)	Accruals quality, association of accruals and cash flows, persistence, restatements
Ferrer and Lainez (2013)	Persistence, predictability, variability, smoothness, earnings management, accruals quality, discretionary accruals.
Perotti and Wagenhofer (2014)	Accruals quality, smoothness, persistence, predictability, value relevance
Hermanns (2006)	Persistence, sustainability, predictability, variability, informativeness, association of accruals and cash flows, expertise of auditors

Table 4 presents the different dimensions of earnings quality considered by several papers that account for the multidimensional nature of earnings quality.

A second problem is that, even if the exact list of desired characteristics were known, it would be necessary to estimate how those characteristics configure the earnings quality measure. This combination should depend on the trade-offs among the costs and benefits of all the properties (DeFond, 2010). Moreover, this combination of the desired characteristics is likely to be different for each user of the financial information, as the concept of earnings quality depends on the decision setting (Dechow et al., 2010). In other words, this problem implies that it would be necessary to estimate the relative importance of each characteristic for each user or each decision-making setting.

A third problem is that it is not clear that all the characteristics reported in Table 1 are really different dimensions of earnings quality, as it can be discussed that several of them may be just different ways of assessing the same characteristic. For instance, discretionary accruals (Ferrer & Lainez, 2013; Schipper & Vincent, 2003), accruals quality (Dechow et al., 2010; Demerjian et al., 2013; Ewert & Wagenhofer, 2011; Ferrer, Callao, Jarne, & Lainez, 2016; Ferrer & Lainez, 2013; Francis et al., 2004; Gaio & Raposo, 2011; Laksmana & Yang, 2009), the association of accruals and cash flows (Dechow & Schrand, 2004; Demerjian et al., 2013; Hermanns, 2006; Schipper & Vincent, 2003), or accruals variability (Chaney et al., 2008) are all referred to the quality of the accruals component of earnings. It can be argued, then, that these are not different properties of earnings quality, but simply different ways of measuring the quality of the accruals portion of earnings. Similarly, persistence, earnings predictability, earnings variability, and earnings smoothing may also be closely related. Dichev and Tang (2009) show that earnings predictability increases with earnings persistence and decreases with earnings variability, and that low-volatility earnings show greater persistence than high-volatility earnings. Additionally, by smoothing earnings, managers reduce the transitory fluctuations in the timing of cash flows (Dechow et al., 2010), thereby making earnings more predictable, with a lower variability, and with a greater proportion of permanent components (Chaney et al., 2008). In summary, what previous authors have named persistence, predictability, variability of earnings and earnings smoothness can be considered as different properties of earnings, but they can also be considered as different ways of assessing the information content of current earnings about future earnings.

A fourth problem is that the relationship between some characteristics and earnings quality is unclear. For instance, some authors consider that earnings smoothing is caused by earnings management (Barth et al., 2008; Ferrer & Lainez, 2013), or that conditional conservatism of earnings enhances earnings quality because it limits the opportunities for income-increasing earnings management (García Lara et al., 2018; LaFond & Watts, 2008; Watts, 2003). Therefore, it is not clear if earnings smoothness or conditional conservatism have any direct influence on earnings quality different from their influence through earnings management.

3.2.1.2. Relationships between Earnings Quality and its Dimensions.

Conceptualization requires that the researcher determines the nature and direction of the relationships between the construct (earnings quality in our case) and their dimensions (Edwards & Bagozzi, 2000). There are two broad ways in which a construct is related to its indicators or dimensions: reflective and formative measurement (Sarstedt, Hair, Ringle, Thiele, & Gudergan, 2016).

In reflective measurement, the indicators are considered as error-prone manifestations of the construct, in the sense that the presence or absence of that construct produces variations in the value of the indicators (Edwards, 2001). In other words, the variations in the indicators' measures are considered *consequences* of the construct. Beliefs, intentions, opinions, perceptions or judgements are typically examples of constructs reflectively related to their indicators (Rodgers & Guiral, 2011). In formative measurement, indicators are seen as the inherent constitutive facets of the construct and, therefore, the indicators as a group jointly determine the conceptual meaning of the construct (Bisbe et al., 2007). The construct can be then modelled as a linear combination of the indicators plus an error disturbance (Bollen & Bauldry, 2011) that represents those causes of the construct that have neither been discussed in prior literature nor revealed by exploratory research (Sarstedt et al., 2016)[10]. Concepts such as liquidity, leverage or profitability, or new non-financial metrics can be represented by formative constructs, combining several pieces of accounting information into a single construct (Rodgers & Guiral, 2011).

The difference between reflective and formative measurement presents important implications for the operationalization process. Thus, in the reflective measurement, all the indicators of a same construct are expected to be highly correlated, given that all of them are affected by the presence of the same construct (Edwards & Bagozzi, 2000). These indicators can be considered as interchangeable, and removing a specific indicator would not alter the conceptual domain of the construct (Bisbe et al., 2007; Jarvis et al., 2003)[11]. Consequently, the researcher does not need to use all the available indicators, because a sample of those indicators can be enough for measuring the concept as far as the convergent and discriminant validity tests support its consistency.

Different from the reflective measurements, the indicators in a formative model are not necessarily highly correlated, because they do not share the same causes[12]. More importantly, they cannot be considered as interchangeable: The omission of an indicator would imply that one of the constitutive facets of the construct are left out, thereby changing the definition of the construct (Jarvis et al., 2003). Therefore, it will not be enough to use a sample of indicators for measuring the concept, but a full census of indicators would be required (Bisbe et al., 2007). Besides, the validity of the construct must be assessed using nomological and/or criterion-related validity, as internal

[10] It is possible, however, that the researcher wants to develop a formative construct that is an exact linear combination of the indicators, with no error term. These constructs are known as composite, and they do not necessarily have conceptual unity, but can be an arbitrary combination of variables (Bollen & Bauldry, 2011).

[11] The fewer indicators included in the model, however, the lower the reliability of the set of indicators.

[12] Given that all the formative indicators influence the same construct, it can be expected some correlation among them, but the model does not assume nor require it (Jarvis et al., 2003).

consistency reliability is an inappropriate criterion for formative measurement models (Jarvis et al., 2003).

The determination of the reflective or formative nature of the relationships between the conceptual variable and its indicators or dimensions is a key feature of the conceptualization, because the misspecification of these relationships may have serious consequences for the drawn conclusions. Various papers have demonstrated that the use of a reflective (formative) measurement model to a truly formative (reflective) construct lead to inaccurate conclusions about the structural relationships between constructs (Chang et al., 2016; Jarvis et al., 2003; MacKenzie et al., 2005; Rodgers & Guiral, 2011). In order to help researchers to select the proper model, Jarvis et al. (2003) compile a set of decision rules for determining whether a construct is formative or reflective. Table 5 reports these rules.

The question about the type of relationship between the earnings quality construct and the empirical proxies that researchers have used to measure it has been scarcely addressed by previous research. In this sense, Dechow et al. (2010) analysed the convergent validity across the earnings quality proxies, concluding that those proxies are not measuring the same construct with varying degrees of accuracy (what would indicate a reflective relationship), but measuring different constructs (what would be compatible with a formative relationship).

Dechow et al. (2010) organized earnings quality proxies into three broad groups: accounting properties of reported earnings, investor responsiveness to reported earnings, and external indicators of earnings misstatements. Following this classification, and applying Jarvis et al.'s (2003) decision rules, we next argue the way in which the proxies of each group are related to the earnings quality construct.

TABLE 5. DECISION RULES FOR DIFFERENTIATING BETWEEN FORMATIVE AND REFLECTIVE MODELS (JARVIS ET AL., 2003)

	Formative model	**Reflective model**
Criterion 1. Direction of causality	• From items to construct • Indicators define characteristics of the construct • Changes in the indicators produce changes in the construct • Changes in the construct should not produce changes in the indicators	• From construct to item • Indicators are manifestations of the construct • Changes in the indicators should not produce changes in the construct • Changes in the construct produce changes in the indicators
Criterion 2. Interchangeability of indicators	• Indicators are not interchangeable • Indicators need not have the same or similar content or share a common theme • Dropping one indicator alters the conceptual domain of the construct	• Indicators are interchangeable • Indicators should have the same or similar content and share a common theme • Dropping one indicator does not affect the conceptual domain of the construct
Criterion 3. Covariation among the indicators	• It is not necessary for indicators to covary with each other • Changes in one indicator are not necessarily associated with changes in the other indicators	• Indicators are expected to covary with each other • Changes in one indicator are associated with changes in the other indicators
Criterion 4. Nomological network of construct indicators	• Nomological network may differ across indicators • Indicators are not required to have the same antecedents and consequences	• Same nomological network for all the indicators • Indicators are required to have the same antecedents and consequences

This table summarizes the rules proposed by Jarvis et al. (2003) to determine if the relationship between a construct and its indicators is formative or reflective.

Accounting properties of reported earnings are those characteristics of the earnings figure that are expected to affect to the usefulness of reported earnings in the decision-making process. Accruals quality, earnings smoothing, earnings predictability or conservatism are typical examples of such characteristics. A common feature of these characteristics is that they are jointly determined by the fundamental performance of the company, the ability of the accounting system to measure such performance, and the manager's decisions on the accounting system (Dechow et al., 2010). In other words, managers make accounting choices that affect to these properties, thereby increasing or decreasing earnings quality level. Applying Jarvis et al.'s conditions, it can be concluded that these earnings properties are related to earnings quality in a formative way, because: (1) The direction of the relationship is from the measures to the construct (the changes in the properties cause changes in earnings quality); (2) the different earnings properties are not substitute nor interchangeable, and they are not highly correlated (Dechow et al., 2010); (3) the different properties do not share the same nomological net nor have the same antecedents and/or consequences. In summary, the relationship between earnings properties and earnings quality appears to be formative.

The other two categories of earnings quality proxies defined by Dechow et al. (2010) are the investor responsiveness to earnings and the external indicators of earnings misstatements. Investor responsiveness to earnings are the measures that analyse the influence of earnings on the equity investors decisions, typically by analysing the relationship between accounting earnings and market returns[13]. The underlying hypothesis is that higher-quality earnings will be of higher relevance for equity investors' decision making and, therefore, the results of these decisions (market returns) will be more closely related to accounting earnings than those of lower quality. The measures included in the third category (external indicators of earnings misstatements) are indicators of the existence of problems with the quality of earnings issued by an external party. These measures are SEC Accounting and Auditing Enforces

[13] The typical proxies for investor responsiveness are the earnings response coefficient (ERC) and the R^2 from the earnings-return model (Dechow et al., 2010). Other proxies that could be classified in this category are the value relevance of earnings or book value (Barth et al., 2008; Francis et al., 2004).

Releases, restatements, and reported internal control procedure deficiencies (Dechow et al., 2010).

These two categories of earnings quality can be considered as consequences of the observation of the earnings quality level by an external party (investors, SEC, or auditors).

According to the definition of the proxies of these two groups, the relationship between those proxies and earnings quality is expected to be reflective, as it is the construct (earnings quality) the cause of the indicator (empirical proxies of investors' reactions or of external indicators of misstatements). Thus, these measures represent knowledge from auditors, managers or SEC, which can be better captured using reflective relationships (Rodgers & Guiral, 2011).

It is unclear, however, that investor responsiveness measures and external indicators represent the same construct, as both categories are not likely to have the same nomological net nor the same antecedents and consequences. The reason would be that the two groups correspond to the reaction to earnings quality of different groups of users of the accounting information (investors, SEC, the management team, and auditors) and, as we have indicated before, the earnings quality construct may differ for the user of the financial information or the specific decision making process (Dechow et al., 2010).

In conclusion, researchers have two alternative ways of measuring earnings quality. On the one hand, they can use a formative model in which several earnings properties are combined to define the earnings quality construct. On the other hand, they can use a reflective model using indicators that reflect the existence or absence of earnings quality for a given decision making setting. Both approaches have their pros and cons. If the formative model is followed, it will be necessary to define and measure all the earnings properties that configure earnings quality, as well as to estimate the weights of each property in the earnings quality construct. The main advantage of this method would be that it can be applied for different decision making settings, simply by estimating the specific weights of each characteristic for that specific setting. The reflective measurement model, on the other hand, presents the advantage that a sample of indicators of earnings quality would be enough if the convergent and discriminant validity tests support its consistency. Its main con is that, as the definition of earnings quality varies with the decision making, only indicators for that specific decision making setting should be included.

For the rest of our doctoral research study, we will focus on the formative measurement model of earnings quality (that is, based on earnings properties) because of two reasons: First, because as we have indicated, the reflective methods (using investor' reactions to earnings quality or external indicators of misstatements) would render an earnings quality measurement for a specific group of users of the financial information (investors in the first case; SEC, managers or auditors in the second), whereas using the formative model we can measure earnings quality for any group of users or decision making setting simply by changing the weights of the earnings properties. Second, because the great majority of studies on earnings quality have tried to measure it using accounting properties, as explained in Chapter 2.

3.2.1.3. Estimation of the weights of each dimension.

After defining the list of desired characteristics, the researcher will need to estimate how those characteristics can be combined to configure the earnings quality measure. As this combination should depend on the trade-offs among the costs and benefits of all the properties for the decision maker (DeFond, 2010), it can be expected that some dimensions will be more relevant (they would produce higher benefits) than others. Moreover, this combination will be different for each user of the financial information, as the benefits and costs of a given characteristic will not be the same for all the groups of users of financial information, making the concept of earnings quality dependent on the decision setting (Dechow et al., 2010).

Additionally, it must be considered if the earnings properties influence earnings quality directly, or if their influence is indirect, as the result of their influence on the other earnings characteristics. For instance, some authors consider that earnings smoothing is caused by earnings management (Barth et al., 2008; Ferrer & Lainez, 2013), or that conditional conservatism of earnings enhances earnings quality because it limits the opportunities for income-increasing earnings management (García Lara et al., 2018; LaFond & Watts, 2008; Watts, 2003). Therefore, it is not clear if earnings smoothness or conditional conservatism have any direct influence on earnings quality different from their influence through earnings management.

3.2.1.4. Empirical Measures.

The conceptual specification level is complete when the researcher has defined all the conceptual variables and the relationships among them. The next step would be to develop how to measure those conceptual variables in the real world (Babbie, 2017). In other words, the researcher needs to specify the directly- or indirectly-observed variables that will serve as indicators of the different constructs defined in the conceptual specification level, and how those indicators will be related to the construct.

For the specific case of earnings quality, researchers should specify the different proxies that will represent each of the earnings characteristics that are related to earnings quality, and how those proxies will be related to the correspondent characteristic.

In this sense, empirical research presents a wide range of different empirical proxies for each of the abovementioned earnings quality characteristics, what makes unclear which one of those empirical proxies provide a more accurate measuring of the represented characteristic. A clear example of this problem is the case of accruals quality. Accruals quality has been measured using different approaches, such as the total value (or the absolute value) of accruals; as the variability of accruals; as the standard deviation of the errors from a residual regression of working capital accruals on lagged, current and forwarded cash-flows (Dechow & Dichev, 2002) or as the residuals (or the absolute value of the residuals) from a model for estimating non-discretionary accruals. These measures have been heavily criticized in the literature (Christodoulou, Ma, & Vasnev, 2018; Dechow et al., 1995; Jackson, 2018; Jones et al., 2008; McNichols & Stubben, 2018). It can be concluded, then, that these empirical indicators are measuring their corresponding earnings characteristic with an error, and that it is not clear which one exhibits the lowest error.

A second problem related with the empirical indicators is that, in some cases, the same indicator may be associated to different earnings characteristics. Thus, for instance, earnings variability can be an indicator of absence of earnings smoothing (Barth et al., 2008) or an indicator of low earnings predictability (Dichev & Tang, 2009). Similarly, the existence of a low negative correlation between accruals and cash-flows can indicate the absence of earnings smoothing, but also a higher level of conditional conservatism (Ball & Shivakumar, 2005). Another example would be the accumulation of negative accruals (Givoly & Hayn, 2000) or the existence of hidden reserves (Penman & Zhang, 2002), which have been used as indicators of unconditional conservatism, but they can also be caused by managers' income-decreasing manipulation, what would indicate a low accruals quality level.

Additionally, it can be discussed the form of the relationship (reflective or formative) between these empirical proxies and the earnings characteristic construct they represent. We argue that the relationship between the different empirical indicators previously used in accounting research and the earnings characteristic construct they represent is reflective, as those empirical proxies are measuring the same construct with different degrees of accuracy, that is to say, they can be considered as reflections of the underlying construct. For example, accruals quality is typically measured using discretionary accruals from a given model for estimating expected non-discretionary accruals. The underlying idea of this method is that the existence of earnings manipulation would make total accruals to deviate from the expected value, thereby generating discretionary accruals. Another example would be the different proxies for earnings smoothing: If managers smooth earnings, we can expect that the variability of the earnings figure will be lower than the variability of the comparing variable (sales or cash-flows); additionally, we can expect that they use accruals for offsetting cash-flows variations, thereby increasing the negative correlation between accruals and cash-flows. Similarly, a high value of ERC would be the consequence of a high investors' responsiveness to earnings, and not the other way.

In summary, the empirical indicators that have been used for representing earnings properties are usually the consequences and not the causes of such properties, being their relationship then reflective.

3.2.2. Evaluation of the Extant Empirical Research on Earnings Quality

In this section, we review the most common approaches followed in previous research for measuring earnings quality –the use of a single proxy, the use of equally-weighted indices, and the use of factor analysis indices[14]– and how those approaches have tried to solve the different problems that arise in the measurement of earnings quality.

The first approach (the use of a single proxy for representing earnings quality) is by far the most prevalent method for measuring accounting quality, as analysed in Chapter 2[15]. Despite the popularity of the use of a single proxy as the measure of earnings quality, the validity of this approach requires that the authors make various strong assumptions in the measurement of earnings quality. First, the authors that use the single-indicator approach assume implicitly that the measured characteristic is the only relevant characteristic for earnings quality or, alternatively, that the other relevant earnings characteristics remain constant for that specific decision making setting. Moreover, it is also assumed that the chosen characteristic is the only relevant characteristic for earnings quality, that is to say, earnings quality is fully defined by that characteristic or, if there are other characteristics, either they have null or negligible influence on earnings quality or they remain constant for that specific decision making setting. Additionally, it is not necessary to assess the nature of the relationship between the characteristic and earnings quality (reflective or formative) because there is only one relevant characteristic for earnings quality. Finally, it is also assumed that the empirical proxy is representing accurately the desired earnings characteristic. Given these strong assumptions, it is not surprising that the results on earnings quality from this approach have rendered mixed results, showing that some expected causes or consequences of earnings quality are related to some of these proxies, but unrelated to others (Dechow et

[14] Some recent papers, though, have used SEM to measure earnings quality (Ferrer et al., 2016; Ferrer & Lainez, 2013; Hinson & Utke, 2018).

[15] In Chapter 2 we indicated that 70.8% of empirical papers on earnings quality used a single property to analyse earnings quality measurement, and 22.7% used several properties but in separate models

al., 2010). Additionally, the huge diversity of metrics for representing earnings quality makes very difficult to interpret the empirical results, because, as we discussed earlier, it is not clear whether these empirical indicators are really measuring different concepts, different facets of a single concept, or the same facet of a concept, as well as whether they are substitutes or complements (Ewert & Wagenhofer, 2011).

The second approach used by the researchers is the construction of a composite variable for representing earnings quality construct. These composite variables are usually built by aggregating the ranking (usually the decile to which the observation belongs) of a set of selected empirical indicators, as explained in Chapter 2. Some examples of papers that follow this approach are Bhattacharya et al. (2003), Leuz et al. (2003), Biddle and Hillary (2006), Burgstahler et al. (2006), Doupnik (2008), Van Tendeloo and Vanstraelen (2008), Boulton et al. (2011), or Gaio and Raposo (2011).

By following this approach, researchers also make some strong implicit assumptions. First, they assume that the list of characteristics that define earnings quality corresponds to those characteristics that are included in the composite index. This list of characteristics, however, is based on the subjective judgement of the researcher. The inclusion of the characteristics is usually justified alleging that such characteristic has been used in previous literature as a proxy of earnings quality, but without making any formal test for assessing the existence of the relationship between the characteristic and the earnings quality construct. Additionally, as the indices are constructed by adding the values of the different characteristics, the implicit relationship between the earnings quality construct and the characteristics is assumed to be formative, what implies that the researcher needs to determine the weight of each one of the properties in the formation of earnings quality. To this respect, these composite variables are typically equally-weighted indices of the different empirical proxies, thereby assuming that all the characteristics have a similar influence on earnings quality. Finally, it is also assumed that the empirical proxies used in the index represent accurately their associated earnings properties.

The third approach is similar to the former one, as it is based on a composite variable of earnings quality, but this composite variable is computed as the common factor score obtained from a factor analysis. Francis et al. (2008) and Bhattacharya et al.

(2012) follow this approach. By using factor analysis for constructing the composite earnings quality variable, researchers assume that the different empirical indicators included in the analysis are manifestations of the same construct, that is to say, that the relationship between earnings quality and the indicators is reflective. They are not considering, then, earnings quality as formed by various different dimensions, but as a single construct that is measured with error by the empirical indicators.

In summary, the different approaches used in previous literature for measuring earnings quality rely on a set of untested strong assumptions that jeopardize their conclusions.

3.2.3. Using Partial Least Squares Method for Measuring Earnings Quality

In section 3.2.1, we discussed a theoretical framework for the measuring of earnings quality. Figure 4 depicts a model in which the relationship of the latent variable *Earnings Quality* on a dependent variable is estimated. For estimating such relationship, three alternative measurement models are defined for our variable of interest, *Earnings Quality*. First, *Earnings Quality* can be computed from a set of *Earnings Properties* that are related to *Earnings Quality* in a formative way (blue arrows). These *Earnings Properties* are also non-observable (latent) variables, so they have to be estimated from a set of empirical indicators that are related in a reflective way to each one of those properties. Alternatively, *Earnings Quality* can also be estimated from a set of indicators that represent the investors' reaction to earnings quality or, alternatively, from a set of external indicators of misstatements. In these two cases, as we have discussed before, the expected relationship between *Earnings Quality* and these indicators is reflective.

As we have indicated before, we will focus on the formative measure model. That is to say, we will consider a researcher whose objective is to estimate the influence of earnings quality on the dependent variable. For measuring earnings quality, this researcher will use a formative model in which earnings quality is formed by the combination of a set of earnings properties. These earnings properties, on the other hand, can be assessed by the values of different empirical indicators.

FIGURE 4: THEORETICAL FRAMEWORK FOR EARNINGS QUALITY MEASURING.

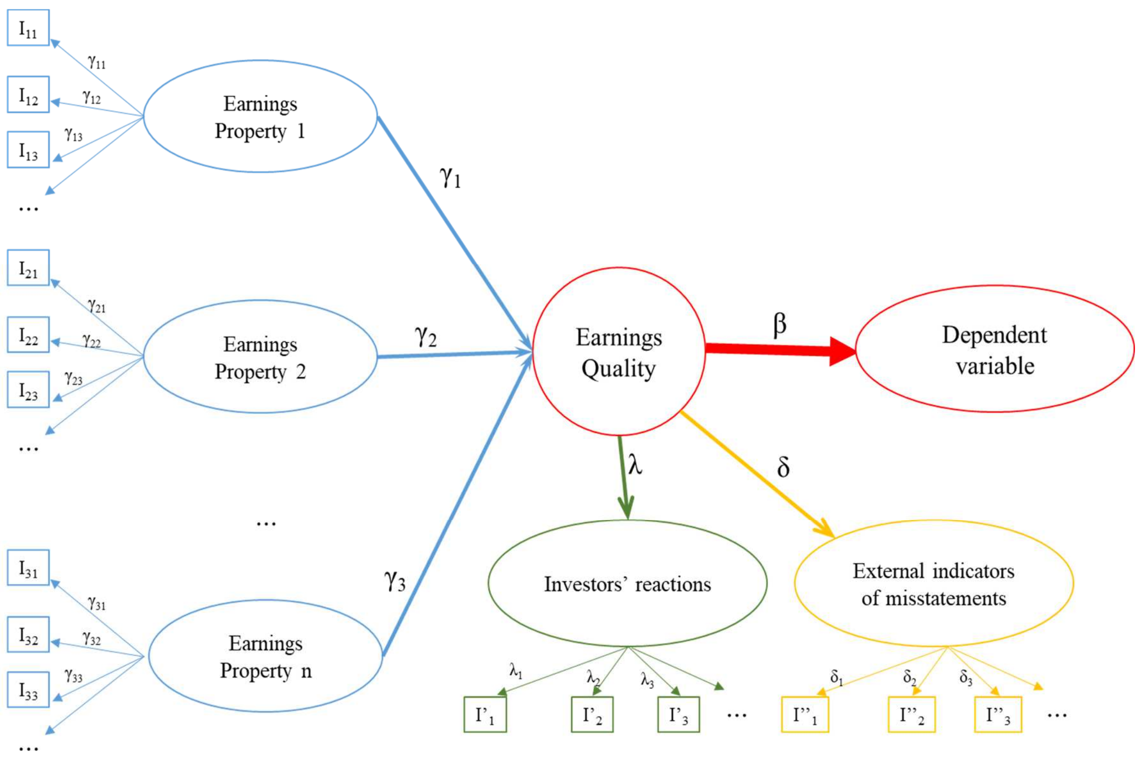


Figure 4 depicts the theoretical framework for estimating the influence of the non-observable variable *Earnings Quality* on a dependent variable using structural equation modelling. Circles and ovals represent non-observable (latent or construct) variables. Squares represent directly-observable variables (or indicators). Our variable of interest (*Earnings Quality*) can be estimated either from a set of earnings properties using a formative model (blue arrows), from the investor's reactions indicators using a reflective model (green arrows), or from the external indicators of misstatements using a reflective model too (yellow arrows).

In our description of the theoretical framework for measuring earnings quality, we indicated a set of problems regarding the conceptualization and the operational process that previous literature has addressed by making some strong implicit assumptions that are difficult to be met in practice. The measurement model in the Partial Least Squares, on the other hand, allows to test if such assumptions are or not hold in practice.

Disregarding of the use of PLS or other technique, the first stage for measuring earnings quality would be the specification of the set of earnings properties that, theoretically, define earnings quality, as well as the empirical indicators that are expected to represent each one of those earnings properties. The definition of these two sets presents several problems, as we have discussed before: Are the selected properties really actual components of earnings quality? Are they different properties or do they represent the same concept? Are the empirical indicators accurately enough to represent their associated earnings property?

Whereas in the traditional methods these questions are answered making strong and untested assumptions (it is assumed that all the selected properties are indeed different components of earnings quality and that the different properties represent accurately their associated property), SEM techniques –including PLS– test the validity of the measurement model, providing answers for the former questions. Actually, the distinctive feature of structural equation modelling in general –and PLS in particular– compared to the traditional methods used in previous research is that SEM allows the testing of the different assumptions related to the measurement of the latent variables, whereas these assumptions remain untested in previous research. Thus, in PLS method, the validity of the measurement model is tested and, only if such validity is assessed, structural model (relationship between latent variables) is evaluated (Fornell & Larcker, 1981; Hair et al., 2011; Hair, Tomas, et al., 2016; Henri, 2007; Henseler et al., 2012; Roldán & Sánchez-Franco, 2012; Ullman, 2006). The logic for this double assessment is that, if empirical measures of the theoretical variables are not confidently representing the construct of interest, it would make nonsense evaluating the relationships between the different theoretical variables (Hair et al., 2011; Henseler, Ringle, & Sarstedt, 2015; Henseler et al., 2009). Then, reliability and validity of latent constructs is considered a prerequisite for accurately estimating relationships between constructs (Nitzl, 2016). Next, we describe the tests used in PLS for assessing the reliability and validity of the earnings quality measure. Following the model depicted in Figure 4, we divide these tests into two groups: the evaluation of the measurement of the different earnings properties, and the evaluation of the earnings quality latent variable.

3.2.3.1. Evaluation of the Measurement of the Earnings Properties.

According to the described model, the different earnings properties can be seen as latent variables that can be empirically measured through a set of empirical indicators. By using the PLS method, the researcher can assess the validity of the measurement of each one of these latent variables, showing that the indicators are really representing accurately the construct, and that the constructs are really representing the same concept, which is different from the concept represented by the other constructs.

Thus, the researcher needs first to specify the set of empirical indicators she/he will use to measure earnings quality, indicating which specific earnings property is represented by each indicator. To this respect, PLS has the advantage of incorporating as many indicators as needed for the definition of the latent variables (Gefen et al., 2011; Lee et al., 2011; Reinartz et al., 2009). Moreover, the high number of proxies to measure a theoretical concept (as happens with earnings quality properties) is not a problem but an advantage for PLS because the consistency of PLS increases with the number of indicators (Gefen et al., 2011; Reinartz et al., 2009; Ringle et al., 2014; Wold, 1980).

Then, the validity of the different earnings properties in PLS method is made basing on four aspects: the individual reliability of each indicator, the internal consistency reliability of the latent variable, the convergent validity of the latent variable, and the discriminant validity of the latent variable.

By analysing the individual reliability of each indicator, the researcher assesses if a specific empirical proxy is really representing accurately its associated earnings property. This analysis is made by checking if most of the variance of the indicator is explained by its associated latent variable (Fornell & Larcker, 1981; Hair et al., 2016; Henseler et al., 2009; Mackenzie, Podsakoff, & Podakoff, 2011; Roldán & Sánchez-Franco, 2012). In details, PLS analyses the strength of such association observing the indicator loadings as absolute correlation between the construct and each indicator (Hair et al., 2011, 2012, 2016; Henseler et al., 2009). The optimal value is loadings above

0.708 (generally accepted 0.7) (Carmines & Zeller, 1979). In social sciences, where there are scales recently developed, values between 0.40 and 0.70 are acceptable (Chin, 1998; Hair et al., 2011; Hair, Tomas, et al., 2016; Roldán & Sánchez-Franco, 2012). Anyway, values below 0.40 are considered non-acceptable because the indicator would not be appropriately representing the latent variable (Hair et al., 2011; Henseler et al., 2009; Roldán & Sánchez-Franco, 2012).

The second test is the internal consistency reliability of the latent variable. With this test, the researcher analyses, for each latent variable whether the different indicators represent the same underlying concept as well as they vary together (Gefen et al., 2000; Mackenzie et al., 2011; Ringle et al., 2014; Roldán & Sánchez-Franco, 2012). In other words, it is expected that all the empirical proxies that are intended to represent some specific earnings property are tightly related, as they are manifestations of the same earnings property. By testing their internal consistency, the researcher checks that all those proxies are related enough to represent the same earnings property. In particular, to assess internal consistency reliability we analyse the composite reliability index by Fornell and Larcker (1981) criterion (Hair et al., 2012; Nitzl, 2016). This index provides an estimate of the reliability of a construct that is based on the intercorrelations of the observed indicator variables (Henseler et al., 2009; Mackenzie et al., 2011) according to their loadings (Hair et al., 2011, 2012, 2016; Henseler et al., 2009; Nitzl, 2016; Roldán & Sánchez-Franco, 2012). This measure is considered as acceptable with values of 0.60 – 0.70 in exploratory research and 0.70 – 0.90 in more advances stages of research (Hair et al., 2011, 2016; Henseler et al., 2009; Numally & Bernstein, 1994; Roldán & Sánchez-Franco, 2012), being values below 0.60 unacceptable (Hair et al., 2016; Henseler et al., 2009).

The third test –convergent validity– checks if the set of indicators are representing one and the same latent variable (Henseler et al., 2009). This test is made by analysing the average proportion of variance of the indicators that the latent variable is able to explain relative to the overall variance of these indicators (Henseler et al., 2015; Roldán & Sánchez-Franco, 2012). Thus, it is expected that, if the empirical proxies are really manifestations of their associated earnings property, a high proportion of the variance of those empirical proxies will be explained by the earnings property.

The measure of this average proportion of variance is called Average Variance Extracted (AVE) and was developed by Fornell and Larcker (1981). The critical value for AVE to be acceptable is a minimum of 0.5 because the construct is explaining more than half (the majority) of the variance of its indicators (Hair et al., 2011, 2016; Henseler et al., 2009; Roldán & Sánchez-Franco, 2012)

Finally, discriminant validity is the extent to which a latent variable is truly distinct from other latent variable by empirical standards. Thus, this analysis allows the researcher to check if the latent variable is unique and captures phenomena of interest that is not represented by other latent variables in the model (Hair et al., 2016; Henseler et al., 2015). In other words, that conceptually different concepts exhibit sufficient difference from other constructs (Henseler et al., 2009; Roldán & Sánchez-Franco, 2012). By testing the discriminant validity, the researcher can check if some apparently related earnings properties are really two different (albeit related) properties or if they truly are the same relevant property. The most commonly analysed measure (Hair et al., 2012; Nitzl, 2016) is the Fornell-Larcker (1981) criterion. This criterion states that any latent construct shares more variance with its assigned indicators than with any other latent variable in the structural model (Hair et al., 2011, 2016; Henseler et al., 2015). The measure is indicative of appropriate discriminant validity whenever the AVE of each construct is greater than its highest squared correlation with any other construct (Hair et al., 2011, 2016, Henseler et al., 2015, 2009; Roldán & Sánchez-Franco, 2012).

The discriminant validity analysis also allows to check if a specific indicator that was initially expected to be associated to one specific earnings property is a better indicator of another different earnings property, thereby showing which is the property that the indicator is better related with. For this purpose, PLS analyses the value of cross loadings from the indicators. This criterion, suggested by Barclay et al (1995) and Chin (1998), states that each indicator must load more highly on their own construct than on any other construct and, consequently, that all constructs must share more variance with their indicators than with any other constructs (Chin, 2010; Hair et al., 2011; Henseler et al., 2015, 2009; Roldán & Sánchez-Franco, 2012).

Apart from these two tests to assess discriminant validity, new more systematic criteria have been developed in prior literature. Henseler et al. (2015) propose the heterotrait-monotrait ratio (HTMT). Technically, HTMT ratio is an estimate of what would be the true correlation between two constructs if they were perfectly measured (Hair et al., 2016). This method is considered a more reliable criterion to assess discriminant validity (Nitzl, 2016). The threshold for this criterion depends on whether latent variables are conceptually very similar (values above 0.90 indicate lack of discriminant validity) or, on the contrary, more distinct (values above 0.85 are unacceptable) (Hair et al., 2016; Henseler et al., 2015).

These tests, in sum, can be used to assess the validity of the different constructs that represent earnings properties, as well as that of their associated indicators. The next step would be to assess if these earnings properties are or not relevant in the formation of earnings quality.

3.2.3.2. Evaluation of the Measurement of Earnings Quality.

According to the model depicted in Figure 4, *Earnings Quality* construct is formed by the combination of the different earnings properties. To know the exact combination of those properties, the weight of each property (γ_i) has to be estimated. A common assumption in previous papers that have estimated earnings quality as a combination of different earnings properties is to assume that these weights are equal for all the included properties. PLS method, on the other hand, estimates the weights for each earnings property that minimize the residual variance of the predictive relationships in each latent variable (Mateos-Aparicio, 2011), thereby increasing the weights of those indicators that are more reliable to explain the latent variable (Hair et al., 2012; Henseler et al., 2014; Rönkkö & Evermann, 2013).

TABLE 6: PROBLEMS IN EARNINGS QUALITY MEASURING AND HOW THE DIFFERENT METHODS ADDRESS THEM

Problem	How addressed by			
	Individual indicator	***Equally-weighted indices***	***Factor analysis indices***	***PLS***
(1) What are the characteristics that define earnings quality?	It is assumed that there is only one relevant characteristic, which is the one measured by the individual indicator	It is assumed that the characteristics included in the index are the only relevant earnings characteristics	There are no different characteristics (reflective relationship)	The author defines an initial set of relevant characteristics. PLS method evaluates if they are or not relevant
(2) What is the relative importance of each characteristic in the definition of earnings quality for each decision making setting?	It is assumed that there is only one relevant characteristic	It is assumed (not tested) that all the characteristics have similar importance (equally-weighted)	There are no different characteristics (reflective relationship)	PLS method estimates the weights for each characteristic
(3) Are the different empirical indicators measuring different earnings properties or are they different ways of measuring a single characteristic?	It is assumed that there is only one relevant characteristic	It is implicitly assumed (not tested) that they represent different characteristics	It is implicitly assumed (not tested) that they represent the same characteristic	PLS method tests if they represent the same or different characteristics (internal consistency, convergent validity, discriminant validity)
(4) Do the different characteristics have a direct influence on earnings quality, or do they only affect other earnings quality characteristics?	It is assumed that there is only one relevant characteristic	It is not tested	There are no different characteristics (reflective relationship)	PLS method allows testing indirect and mediating effects
(5) What is the type of relationship (reflective or formative) between earnings quality and its characteristics?	It is assumed that there is only one relevant characteristic	Assumed formative	Assumed reflective	The author defines theoretically the expected type of relationship. PLS method allows testing both formative and reflective relationships.
(6) How accurate is the indicator in representing the earnings characteristic to be measured?	It is assumed (not tested) that the indicator reflects accurately the earnings characteristic	It is assumed (not tested) that the indicators reflect accurately the earnings characteristics	It is assumed (not tested) that the indicators reflect accurately earnings quality	PLS method tests indicator individual reliability
(7) Which specific characteristic is exactly representing the empirical indicator?	It is assumed (not tested) that the indicator is really measuring its associated characteristic and not other different characteristic	It is assumed (not tested) that the indicators are really measuring their associated characteristics and not other different characteristics	It is assumed (not tested) that the indicators are really measuring earnings quality	PLS method tests to which characteristic is the indicator more associated

Table 6 summarizes the main problems that should be addressed when measuring earnings quality and how the different approaches for earnings quality measurement have addressed then. Rows present the problems. Columns present the approaches (individual indicator, equally-weighted indices, factor analysis indices and, finally, the proposed new approach Partial Least Squares).

The estimation of these weights have several implications for the estimation of the earnings quality model. The first implication is that this estimation allows the researcher to evaluate which earnings properties are relevant (high weights) or irrelevant (low weights) for the decision making of the study, by simply analysing the significance of their weights. Additionally, it is also possible to assess which earnings properties are more valued for that specific decision making setting, by simply comparing the different values of the weights. The PLS method also allows the test of indirect and moderated relationships. By testing these possible relationships, the researcher can assess if the observed influence of a given property on earnings quality is really a direct influence or if it is caused by its relationship with a different earnings property.

In summary, the PLS method presents several advantages over the traditional methods for measuring earnings quality, as the evaluation of the validity of the measures, the possibility of using both reflective and formative relationships, or the possibility of testing indirect and mediated relationships. A summary of these advantages is presented in Table 6, which records the main problems highlighted in section 3.2.2 and how the different approaches deal with these problems.

3.3. A COMPARISON OF THE PERFORMANCE OF THE METHODS EMPLOYED TO MEASURE EARNINGS QUALITY.

In this section, we conduct a simulation process to compare the estimates of the different approaches that have been previously used to measure earnings quality with the PLS method. In this simulation process, we estimate the influence of a non-observable earnings quality construct (noted by *EQ*) on a dependent variable (noted as *DEPENDENT*). Earnings quality construct *EQ* is formed by five characteristics (from EQ_1 to EQ_5), existing a formative relationship between the construct and its dimensions. We consider five available indicators for estimating each dimension (we noted them as eq_{ij}, ranging both i and j from 1 to 5). Figure 5 represents the relationships of the simulated model.

FIGURE 5: SCHEME OF CONSTRUCTS, DIMENSIONS AND INDICATORS FOR THE SIMULATION PROCESS.

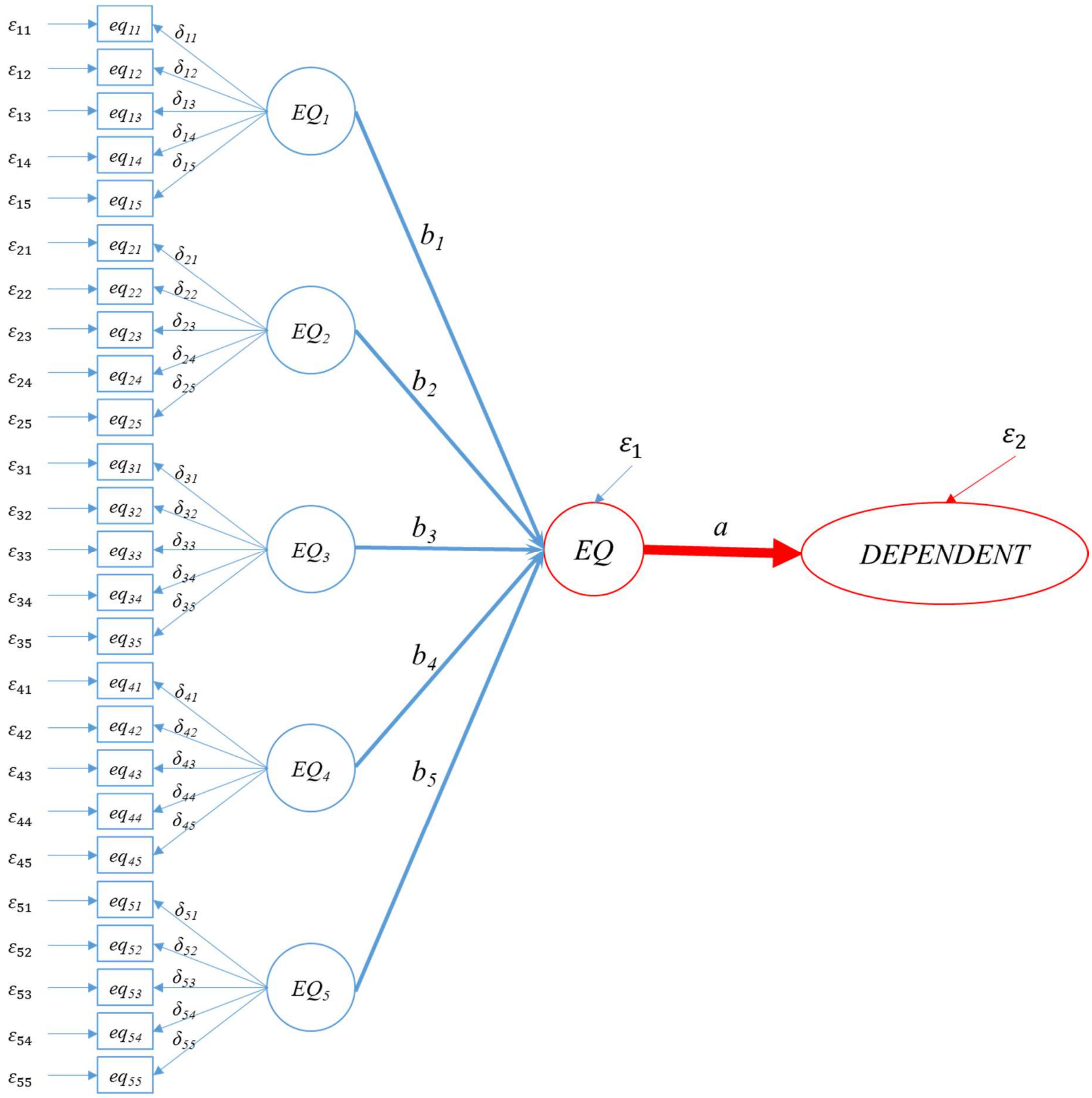


Figure 5 depicts the scheme representation of the parsimonious model of earnings. Round shapes represent latent variables, whereas square shapes represent indicators.

3.3.1. Description of the Simulation Process.

The process for the simulation is as follows:

We first simulate the correlations among the five earnings characteristics (EQ_1 to EQ_5) using a semipositive definite symmetric matrix whose values (except in the main diagonal) are drawn from a uniform distribution with values between –0.25 and +0.25[16].

Then, we generate the values for the five earnings characteristics from a multivariate normal distribution with 0 mean, standard deviation equal to 1, and using the correlations of the former matrix.

In the second step, we computed the value of the earnings quality construct according to the following equation:

$$EQ = \sum_{i=1}^{5} b_i \cdot EQ_i + \varepsilon_1.$$

EQ represents the earnings quality construct, being EQ_i the values generated for the five dimensions that form the construct. b_i are the weights of each dimension. As we assume that these weights are unknown for the researcher, we generated five random values from a uniform distribution between 0 and 1, one for each one of the five parameters b_i. The value of each parameter b_i is then computed as the proportion of its correspondent random number divided by the sum of all the five random numbers, thereby granting that the sum of the five parameters b_i is equal to 1. The error term of the equation (ε_1) is also generated from a normal distribution with zero mean, and uncorrelated with all the other random variables. We also assume that the standard deviation of this error is not observable, so we computed that as a proportion (generated from a random variable distributed uniformly between 0.1 and 0.4) of the standard deviation of the construct explained by the five dimensions. The error is then generated

[16] These values are consistent with the empirical correlations observed by Dechow et al. (2010) among the different earnings properties.

from a normal variable with zero mean and that standard deviation. After computing the values of EQ, we standardized this variable by subtracting its mean and dividing by its standard deviation to get a variable with null mean and standard deviation equal to 1.

We then computed the values of the dependent variable according to the next equation:

$$DEPENDENT = a \cdot EQ_{st} + \varepsilon_2,$$

where *DEPENDENT* denotes the values of the dependent variable; *a* is the coefficient of the linear relationship between the dependent variable and the standardized values of the earnings quality construct (EQ_{st}); the error term (ε_2) is simulated from another normal standard variable with 0 mean and independent from any other random variable. The standard deviation of this error is computed for making the standard deviation of *DEPENDENT* equal to 1. Additionally, we set the value of parameter *a* in 0.5[17].

Then, for each earnings quality dimension (EQ_i), we simulated five indicator variables (from eq_{i1} to eq_{i5}) according to the next equation:

$$eq_{ij} = \delta_{it} \cdot EQ_i + \varepsilon_{ij}.,$$

where eq_{ij} represents each indicator; EQ_i is the earnings quality dimension represented by that indicator; parameter δ_{it} represents the relationship between the indicator and the component; and ε_{ij} is the error term. We assume that the researcher does not know the exact relationship between the indicators and the components (δ_{it}), so the values of δ_{it} were randomly generated from a uniform distribution between 0.5 and 1. The error term is generated from a normal distribution with zero mean and

[17] We repeated the simulation process with different values for parameter *a* (specifically, 1, 0.25 and 0.1). The results (untabulated) were not qualitatively different from those reported.

uncorrelated with all the other variables, and with a standard deviation computed for making the standard deviation of the indicator equal to 1.

We use this simulation process to compare the following four approaches in estimating earnings quality:

1. As the most extended approach to the measurement of earnings quality in previous literature has been the selection of a single proxy. In this approach we picked just one of the indicators (specifically, eq_{11}) as the first earnings quality proxy.
2. The second approach is the formation of an equally-weighted index, which is the most common approach in previous literature to a multi-dimensional measure of earnings quality. Consistent with previous research, we computed this index as the average decile ranking of the chosen indicators for each observation. Given that the other earnings quality variables are distributed normally with mean 0 and standard deviation 1, and to avoid the potential bias effect of the metrics of the latent variables (Aguirre-Urreta and Marakas, 2012; Chang et al., 2016), we standardized the values of the index by subtracting its mean and dividing the result by its standard deviation.
3. In the third approach, we computed earnings quality as the common factor from the factorial analysis of the chosen earnings components, consistent with those papers that used this method in previous research (Francis et al., 2008; Bhattacharya et al., 2012).
4. Finally, we estimated a fourth earnings quality proxy using Partial Least Squares, considering that earnings quality is a 2^{nd}-level non-observable construct that is formatively related to other 1^{st}-level non-observable constructs (EQ_i), related reflectively to their corresponding indicators.

For each variable, we generated 20,000 observations and estimated the coefficient for the linear relationship between the dependent variable and each one of the four earnings quality proxies (single indicator, average decile ranking index, common factor and PLS estimation). Then, we computed the error for each variable as the square of the difference between the actual value of parameter a (0.5) and the estimated coefficient. We iterated this process 10,000 times and computed the average estimation error for each earnings quality measure.

Additionally, in order to test the robustness of the multidimensional approaches (average decile ranking index, common factor and PLS estimation) to the use of limited information, we computed them considering only 4, 3 or 2 dimensions (from the actual 5 dimensions) and using 4, 3 or 2 indicators per dimension (from the actual 5 available indicators).

3.3.2. Simulation Results.

Results for the simulation process are reported in Table 7. Panel A of table 4 reports the average quadratic estimation errors for the four approaches when all the information is used (five dimensions, five indicators per dimension). The highest error (0.1703) is observed for the Factor index. This high error is consistent with those studies that highlight the misspecification problems that arise when a reflective measurement model to formative relationships (Chang et al., 2016; Jarvis et al., 2003; MacKenzie et al., 2005; Rodgers & Guiral, 2011). The single indicator method exhibits the second highest error (0.1502), showing that the most common measurement method used in previous research is likely to lead to erroneous inferences about the relationship between earnings quality and its causes or consequences.

The decile ranking indices and the PLS methods exhibit the lower estimation errors. This result is not surprising, given that these two methods consider that the relationship between the earnings properties and the earnings quality construct is formative. The difference between these two methods, however, is that, whereas the deciles ranking index considers that all the empirical indicators have the same influence on the earnings quality construct, the PLS method estimates first the factor scores for each earnings property, and then estimates the actual weights of these properties in earnings quality. The result is that the PLS method outperforms all the other methods in all the different settings.

TABLE 7: SIMULATION PROCESS RESULTS

Panel A. Complete information

	Single indicator	Equally-weighted index	Factor index	PLS
Average squared error	0.1502	0.0822	0.1703	0.0613

Panel B. Incomplete information

		Dimensions		
	Indicators	4	3	2
Decile ranking index	4	0.0966	0.1134	0.1352
	3	0.0972	0.1140	0.1357
	2	0.0983	0.1150	0.1366
Factor analysis index	4	0.1726	0.1741	0.1882
	3	0.1725	0.1739	0.1880
	2	0.1718	0.1731	0.1866
PLS	4	0.0758	0.0944	0.1218
	3	0.0763	0.0949	0.1221
	2	0.0773	0.0958	0.1230

Table 7 reports the average squared estimation errors for the different approaches (single indicator, equally-weighted index, factor index, and PLS). Panel A reports the results for complete information (5 dimensions, 5 indicators per dimension). Panel B reports the results of the multidimensional approaches when the information is incomplete (using from 4 to 2 dimensions and from 4 to 2 indicators).

One potential problem that cannot be solved with PLS is that, for properly estimating a formative measurement model, a full census of the dimensions is required. It may be difficult for researchers, though, to make sure that all the possible causes related to the construct are accounted for (Davick, 2014; Ringle et al., 2012). Additionally, as we indicated before, the consistency of PLS increases with the number of indicators (Gefen et al., 2011; Reinartz et al., 2009; Ringle et al., 2014; Wold, 1980), so a low number of indicators would increase the estimation error of this method. To assess the performance of the PLS when the information is not complete (that is, when not all the dimensions are or all the indicators are used), we computed the average square errors using less than five indicators per earnings property and less than five earnings properties. Results are reported in Panel B of Table 4.

These results show that, as the information becomes more incomplete, all the methods suffer an increase in their estimation errors[18]. Despite this increase in the errors, the PLS method still outperforms the alternative methods.

In conclusion, these simulation results show that the PLS method produces smaller estimation errors than the methods previously used for measuring earnings quality, even in situations if the researcher has not identified all the earnings properties or has not used all the different empirical indicators available for each earnings property. Hence, PLS estimation of earnings quality is less biased than either single-indicator, equally-weighted ranking or common factor estimations in all settings. Consequently, it is expected that the application of this method to earnings quality estimation improves its measurement, yielding a lower estimation error (thus, less biased estimates).

3.4. CONCLUSIONS FOR CHAPTER 3.

Despite the abundant research on earnings quality, there is no a clear, unique and explicit definition of earnings quality nor a common agreement on which the dimensions indicative of earnings quality are and their relationship with earnings quality.

Based on Dechow et al. (2010), we discuss the nature of the relationship between the different indicators of earnings quality that have been employed in previous empirical research and the earnings quality construct. Applying Jarvis et al.'s (2003) decision rules, we conclude that the earnings properties identified by Dechow et al. (2010) can be considered dimensions of the earnings quality construct, with a formative relationship among these properties and earnings quality, whereas investors' responsiveness to earnings and external indicators of misstatements can be considered

[18] The estimation errors of the factor analysis index, however, gets slightly reduced when the number of indicators is reduced.

reflections of earnings quality. The implications of this differentiation for empirical research on earnings quality are multiple. Thus, if a researcher aims to measure earnings quality through earnings properties, a formative approach should be used. The empirical implications of this type of relationship are that a full census of the dimensions that define earnings quality is necessary and that the reliability of the construct cannot be assessed through an estimate of internal consistency. If the researcher aims to measure earnings quality using investors' responsiveness to earnings or external indicators of earnings misstatements, the adopted approach should be a reflective one. In this case, a full census of indicators is not necessary, as all of them are reflections of the same construct. Additionally, the reliability of the construct can be assessed using measures of internal consistency. This classification is also helpful for avoiding the use of reflective measures in a formative approach or formative measures in a reflective approach, as this misspecification is likely to produce important biases in the estimates.

Additionally, we present a discussion about the traditional techniques used in earnings quality measurement and the potential boundaries of new methods that have been applied in other disciplines. Despite its popularity in other research fields, SEM method –and, particularly, the Partial Least Squares (PLS) method– has not been broadly applied in archival accounting research. In this Chapter we present an overview of SEM techniques, focusing especially on PLS method. We review the problems associated to the measurement of earnings quality, comparing how the traditional methods and the PLS method try to overcome those problems. Our conclusion is that, whereas the traditional methods overcome those problems making strong (and untested) implicit assumptions, PLS method allows the testing of such assumptions, giving researchers a more flexible tool for testing their hypotheses.

Finally, we propose the use of second-generation regression methods to improve the estimates of the relationships between the earnings quality construct and other variables. For a better assessment of the advantages of the use of PLS, we run a simulation process where the performance of PLS and the traditional methods used for measuring earnings quality (single indicator, equally weighted index, and common factor scores from a factorial analysis) were compared. The results show that the PLS model typically outperforms the other approaches, even in scenarios with poor information, producing estimation errors considerably lower than the rest of approaches.

Considering such potential improvement for earnings quality estimation, together with the extended use of PLS in other social science areas to systematically assess the validity of the measurement through several explicative dimensions, we find PLS suitable for earnings quality measurement.

In the next Chapter, we propose a research design of a model for earnings quality estimation using PLS method. Following the scale validation technique (Diamantopoulos & Winklhofer, 2001), the proposed model analyses the effect of earnings quality determinants (earnings properties, formative relationship) on earnings quality outcomes (investor responsiveness to accounting information, reflective relationship).

3.5 REFERENCES FOR CHAPTER 3.

Babbie, E. (2017). *The basics of social research (7th ed.).* (Cengage, Ed.) (7th ed.). Boston, United States, Boston: Wadsworth Publishing.

Ball, R., & Shivakumar, L. (2005). Earnings quality in UK private firms: comparative loss recognition timeliness. *Journal of Accounting & Economics*, *39*(1), 83–128.

Barclay, D. W., Higgins, C. A., & Thompson, R. (1995). The partial least squares approach to causal modeling: personal computer adoption and use as illustration. *Technology Studies*, *2*(2), 285–309.

Barth, M. E., Landsman, W. R., & Lang, M. (2008). International Accounting Standards and Accounting Quality. *Journal of Accounting Research*, *46*(3), 467–498.

Becker, J. M., Rai, A., & Rigdon, E. E. (2013). Predictive Validity and Formative Measurement in Structural Equation Modeling: Embracing Practical Relevance. *Thirty Fourth International Conference on Information Systems*, 1–19.

Bhattacharya, N., Ecker, F., Olsson, P., & Schipper, K. (2012). Direct and mediated associations among earnings quality, information asymmetry, and the cost of equity. *The Accounting Review*, *87*(2), 449–482.

Bhattacharya, U., Daouk, H., & Welker, M. (2003). The world price of earnings opacity. *The Accounting Review*, *78*(3), 641–678.

Biddle, G. C., & Hilary, G. (2006). Accounting Quality and Firm-Level Capital Investment. *The Accounting Review*, *81*(5), 963–982.

Bisbe, J., Batista-Foguet, J.-M., & Chenhall, R. (2007). Defining management accounting constructs: A methodological note on the risks of conceptual misspecification. *Accounting, Organizations and Society*, *32*(7–8), 789–820.

Blanthorne, C., Jones-Farmer, L. A., & Almer, E. D. (2006). Why you should consider SEM: A guide to getting started. In V. Arnold, B. D. Clinton, P. Luckett, R. Roberts, C. Wolfe, & S. Wright (Eds.), *Advances in Accounting Behavioral Research* (Vol. 9, pp. 179–207). Emerald Group Publishing, Limited.

Bollen, K. A. (2002). Latent variables in psychology and the social sciences. *Annual Review of Psychology*, *53*, 605–34.

Bollen, K. A., & Bauldry, S. (2011). Three Cs in measurement models: causal indicators, composite indicators, and covariates. *Psychological Methods*, *16*(3), 265–84.

Boulton, T. J., Smart, S. B., & Zutter, C. J. (2011). Earnings Quality and International IPO Underpricing. *The Accounting Review*, *86*(2), 483–505.

Burgstahler, D., Hail, L., & Leuz, C. (2006). The Importance of Reporting Incentives: Earnings Management in European Private and Public Firms. *The Accounting Review*, *81*(5), 983–1016.

Carmines, E. G., & Zeller, R. A. (1979). *Reliability and validity assessment. SAGE University Papers on Quantitative Applications in the Social Sciences 07-17.*

Beverly Hills, CA: SAGE.

Cepeda, G., & Roldán, J. L. (2013). Modelos de Ecuaciones Estructurales basados en la covarianza y la varianza. In *V Taller de Investigación en Contabilidad de ASEPUC* (pp. 1–34).

Chaney, P. K., Cooil, B., & Jeter, D. (2008). *A latent class model of earnings attributes*.

Chang, W., Franke, G. R., & Lee, N. (2016). Comparing reflective and formative measures: New insights from relevant simulations. *Journal of Business Research*, *69*(8), 3177–3185.

Chin, W. (1998). The partial least squares approach for estructural equation modeling. . *Modern Methods for Business Researchs*, *Mahwah (NJ*, 295–336.

Chin, W. W. (2010). How to write up and report PLS analyses. In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of Partial Least Squares: Concepts, methods and applications* (pp. 655–690). Berlin, Germany: Springer-Verlag.

Christodoulou, D., Ma, L., & Vasnev, A. (2018). Inference-in-residuals as an Estimation Method for Earnings Management. *Abacus*, *54*(2), 154–180.

Davick, N. S. (2014). The use and misuse of structural equation modeling in management research: A review and critique. *Journal of Advances in Management Research*, *35*(2008), 441–458.

Dechow, P., & Dichev, I. (2002). The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, *77*(Supplement), 35–59.

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting & Economics*, *50*(2/3), 344–401.

Dechow, P., & Schrand, C. (2004). Earnings quality. *The Research Foundation of CFA*

Institute.

Dechow, P., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review*, *70*(2), 193–225.

DeFond, M. L. (2010). Earnings quality research: Advances, challenges and future research. *Journal of Accounting & Economics*, *50*(2–3), 402–409.

Demerjian, P., Lewis, M., Lev, B., & McVay, S. (2013). Managerial ability and earnings quality. *The Accounting Review*, *88*(2), 463–498.

Diamantopoulos, A., & Winklhofer, H. M. (2001). Index Construction with Formative Indicators: An Alternative to Scale Development. *Journal of Marketing Research*, *38*(2), 269–277.

Dichev, I., & Tang, V. W. (2009). Earnings volatility and earnings predictability. *Journal of Accounting and Economics*, *47*(1–2), 160–181.

Dijkstra, T. K., & Henseler, J. (2015). Consistent and asymptotically normal PLS estimators for linear structural equations. *Computational Statistics and Data Analysis*, *81*, 10–23.

Doupnik, T. S. (2008). Influence of Culture on Earnings Management: A Note. *Abacus*, *44*(3), 317–340.

Edwards, J. R. (2001). Multidimensional constructs in organizational behavior research: An integrative analytical framework. *Organizational Research Methods*, *4*(2), 144–192.

Edwards, J. R., & Bagozzi, R. P. (2000). On the nature and direction of relationships between constructs and measures. *Psychological Methods*, *5*(2), 155–74.

Ewert, R., & Wagenhofer, A. (2011). *Earnings quality metrics and what they measure* (Working Paper). University of Graz.

Ferrer, C., Callao, S., Jarne, I., & Lainez, J. (2016). A Structural Equation Model for

Analyzing the Association between some Attributes of Earnings Quality and Value Relevance. *Modeling and Simulation in Engineering, Economics and Management*, *115*, 31–39.

Ferrer, C., & Lainez, J. (2013). Detecting Differences on the Earnings Quality Measurement: Empirical Evidence on Spanish Firms. *Revista de Métodos Cuantitativos Para La Economía y La Empresa*, *16*, 5–28.

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(1), 39–50.

Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2004). Costs of Equity and Earnings Attributes. *The Accounting Review*, *79*(4), 967–1010.

Francis, J., Nanda, D., & Olsson, P. (2008). Voluntary disclosure, earnings quality and cost of capital. *Journal of Accounting Research*, *46*(1), 53–99.

Francis, J., Olsson, P., & Schipper, K. (2006). Earnings quality. *Foundation and Trends in Accounting*, *1*, 259–340.

Gaio, C., & Raposo, C. (2011). Earnings quality and firm valuation: International evidence. *Accounting and Finance*, *51*(2), 467–499.

García Lara, J. M., García Osma, B., & Penalva, F. (2018). *Accounting conservatism and the limits to earnings management*. *Working Paper*.

Gefen, D., Rigdon, E. E., & Straub, D. W. (2011). An Update and Extension to SEM Guidelines for Administrative and Social Science Research. *MIS Quarterly*, *35*(2), iii-A7.

Gefen, D., Straub, D. W., & Boudreau, M.-C. (2000). Structural Equation Modeling and Regression: Guidelines for Research Practice. *Communications of the Association for Information Systems*, *4*(1), 7.

Givoly, D., & Hayn, C. (2000). The changing time-series properties of earnings, cash flows and accruals: Has financial reporting become more conservative? *Journal of Accounting & Economics*, *29*(3), 287–320.

Gow, I. D., Larcker, D. F., & Reiss, P. C. (2016). Causal Inference in Accounting Research. *Journal of Accounting Research*, *54*(2), 477–523.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *The Journal of Marketing Theory and Practice*, *19*(2), 139–152.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. *Long Range Planning*, *46*(1–2), 1–12.

Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012). The Use of Partial Least Squares Structural Equation Modeling in Strategic Management Research: A Review of Past Practices and Recommendations for Future Applications. *Long Range Planning*, *45*(5–6), 320–340.

Hair, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced Issues in Partial Least Squares Structural Equation Modeling* (2nd ed.). Thousand Oaks, CA, CA: Sage.

Hair, J. F., Tomas, G., Hult, M., Ringle, C. M., & Sarstedt, M. (2016). *A primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (2nd ed.). Thousand Oaks, CA: Sage.

Hampton, C. (2015). Estimating and Reporting Structural Equation MOdels with Behavioral Accounting Data. *Behavioral Research in Accounting*, *27*(2), 1–34.

Henri, J.-F. (2007). A quantitative assessment of the reporting of Structural Equation Modeling Information. The case of management accounting research. *Journal of Accounting Literature*, *26*, 76–115.

Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub,

D. W., … Calantone, R. (2014). Common Beliefs and Reality About PLS: Comments on Ronkko and Evermann (2013). *Organizational Research Methods*, *17*(2), 182–209.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2012). Using partial least squares path modeling in advertising research: basic concepts and recent issues. In S. Okazaki (Ed.), *Handbook of Research on International Advertising* (pp. 252–276). Cheltenham, UK: Edward Elgar.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares structural equation modeling in marketing research. *Advances in International Marketing*, *20*, 277–320.

Henseler, J., & Sarstedt, M. (2013). Goodness-of-fit indices for partial least squares path modeling. *Computational Statistics*, *28*(2), 565–580.

Hermanns, S. (2006). *Financial Information and Earnings Quality: a literature review*.

Hinson, L. A., & Utke, S. (2018). *Structural Equation Modeling in Archival Capital Markets Research*.

IASB. The Conceptual Framework for Financial Reporting (2010). London.

Jackson, A. B. (2018). Discretionary Accruals: Earnings Management ... or Not? *Abacus*, *54*(2), 136–153.

Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research*, *30*(2), 199–218.

Jones, K. L., Krishnan, G. V, & Melendrez, K. D. (2008). Do Models of Discretionary

Accruals Detect Actual Cases of Fraudulent and Restated Earnings? An Empirical Analysis. *Contemporary Accounting Research*, *25*(2), 6.

LaFond, R., & Watts, R. L. (2008). The Information Role of Conservatism. *The Accounting Review*, *83*(2), 447–478.

Laksmana, I., & Yang, Y. (2009). Corporate citizenship and earnings attributes. *Advances in Accounting*, *25*(1), 40–48.

Larcker, D. F., & Rusticus, T. O. (2010). On the use of instrumental variables in accounting research. *Journal of Accounting and Economics*, *49*(3), 186–205.

Lee, L., Petter, S., Fayard, D., & Robinson, S. (2011). On the use of partial least squares path modeling in accounting research. *International Journal of Accounting Information Systems*, *12*(4), 305–328.

Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: an international comparison. *Journal of Financial Economics*, *69*(3), 505–527.

Leuz, C., & Wysocki, P. D. (2016). The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research. *Journal of Accounting Research*, *54*(2), 525–622.

Libby, R., Bloomfield, R., & Nelson, M. W. (2002). Experimental research in financial accounting. *Accounting, Organizations and Society*, *27*(8), 775–810.

MacKenzie, S. B., Podsakoff, P. M., & Jarvis, C. B. (2005). The problem of measurement model misspecification in behavioral and organizational research and some recommended solutions. *Journal of Applied Psychology*, *90*(4), 710–730.

Mackenzie, S. B., Podsakoff, P. M., & Podakoff, N. P. (2011). Construct measurement and validation procedures in mis and behavioral research: integrating new and existing techniques. *MIS Quarterly*, *35*(2), 293–334.

Mateos-Aparicio, G. (2011). Partial Least Squares (PLS) Methods: Origins, Evolution, and Application to Social Sciences. *Communications in Statistics - Theory and Methods*, *40*(13), 2305–2317.

McNichols, M. F., & Stubben, S. R. (2018). Research Design Issues in Studies Using Discretionary Accruals. *Abacus*, *54*(2), 227–246.

Nitzl, C. (2016). The use of partial least squares structural equation modelling (PLS-SEM) in management accounting research: Directions for future theory development. *Journal of Accounting Literature*, *37*, 19–35.

Numally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York, NY: Mc Graw Hill.

Penman, S. H., & Zhang, X.-J. (2002). Accounting conservatism, the quality of earnings, and stock returns. *The Accounting Review*, *77*(2), 237–264.

Perotti, P., & Wagenhofer, A. (2014). Earnings quality measures and excess returns. *Journal of Business Finance & Accounting*, *41*(5–6), 545–571.

Reinartz, W., Haenlein, M., & Henseler, J. (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of Research in Marketing*, *26*(4), 332–344.

Rigdon, E. E. (2012). Rethinking Partial Least Squares Path Modeling: In Praise of Simple Methods. *Long Range Planning*, *45*(5–6), 341–358.

Rigdon, E. E. (2014). Rethinking Partial Least Squares Path Modeling: Breaking Chains and Forging Ahead. *Long Range Planning*, *47*(3), 161–167.

Rigdon, E. E. (2016). Choosing PLS path modeling as analytical method in European management research: A realist perspective. *European Management Journal*, 1–8.

Ringle, C. M., Sarstedt, M., & Schlittgen, R. (2014). Genetic algorithm segmentation in partial least squares structural equation modeling. *OR Spectrum*, *36*(1), 251–276.

Ringle, C. M., Sarstedt, M., & Straub, D. W. (2012). A critical look at the use of PLS-SEM in MIS Quarterly. *MIS Quarterly*, *36*(1), 3–14.

Rodgers, W., & Guiral, A. (2011). Potential model misspecification bias: Formative indicators enhancing theory for accounting researchers. *The International Journal of Accounting*, *46*(1), 25–50.

Roldán, J. L., & Sánchez-Franco, M. J. (2012). Variance-based structural equation modeling: Guideliness for using partial least squares in information systems research. In M. Mora, O. Gelman, A. Steenkamp, & M. S. Raisinghani (Eds.), *Research Methodologies, Innovations and Philosophies in Software Systems Engineering and Information Systems* (pp. 193–211). Hershey, PA: IGI Global.

Rönkkö, M., & Evermann, J. (2013). A critical examination of common beliefs about partial least squares path modeling. *Organizational Research Methods*, *16*(3), 425–448.

Sarstedt, M., Hair, J. F., Ringle, C. M., Thiele, K. O., & Gudergan, S. P. (2016). Estimation issues with PLS and CBSEM: Where the bias lies! *Journal of Business Research*, *69*(10), 3998–4010.

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2014). PLS-SEM: Looking Back and Moving Forward. *Long Range Planning*, *47*(3), 132–137.

Schipper, K., & Vincent, L. (2003). Earnings quality. *Accounting Horizons*, *17*, 97–110.

Tenenhaus, M., Vinzi, V. E., Chatelin, Y. M., & Lauro, C. (2005). PLS path modeling. *Computational Statistics and Data Analysis*, *48*(1), 159–205.

Ullman, J. B. (2006). Structural Equation Modeling : Reviewing the Basics and Moving Forward. *Journal of Personality Assessment*, *87*(1), 35–50.

VanTendeloo, B., & Vanstraelen, A. (2008). Earnings Management and Audit Quality in Europe: Evidence from the Private Client Segment Market. *European Accounting Review*, *17*(3), 447–469.

Watts, R. L. (2003). Conservatism in accounting part I: Explanations and implications. *Accounting Horizons*, *17*(3), 207–221.

Wold, H. (1980). Model Construction and Evaluation When Theoretical Knowledge is scarce. *Bureau of Economic Research*, 47–74.

Wold, H. (1982). Soft modeling: the basic design and some extensions. In K. G. Jöreskog & H. Wold (Eds.), *Systems under Indirect Observation: Causality, Structure, Prediction, vol. 2. North Holland, Amsterdam* (pp. 1–54). Amsterdam: North-Hollandl.

Wold, H. (1985). Systems Analysis by Partial Least Squares. *Measuring the Unmeasurable*, (September), 713.

CHAPTER 4

Empirical application of PLS to earnings quality measuring

CHAPTER 4. EMPIRICAL APPLICATION OF PLS TO EARNINGS QUALITY MEASURING

4.0. INTRODUCTION TO CHAPTER 4.

In previous chapters we have summarized the advantages of second-generation regression methods (specifically the PLS method) over first-generation methods. Namely, PLS is potentially useful to alleviate misspecification, proxy selection and correlated omitted variables problems. Moreover, the comparative analysis of several earnings quality estimation methods with the simulation procedure evidenced such theoretical superiority of PLS for earnings quality measurement. Additionally, as explained in Chapter 3, PLS can undertake a validation scale process to assess the validity of the measurement of the different dimensions explaining earnings quality through the proxies that have been used in prior literature to empirically represent them.

In this chapter, we apply the PLS to earnigns quality measurement using real archival data. For doing so, we first analyse the validity of the main proxies that have been used in prior literature for measuring earnings quality. For that purpose, following the scale validation process described by Diamantopoulos and Winklhofer (2001), we run a Multiple-Indicator-Multiple-Cause (MIMIC) model to connect the determinants (explicative factors) of the variable object of study with its consequences. In this regard, we estimate a model that relates four properties of earnings that are expected to be dimensions of the earnings quality construct (accruals quality, earnings smoothing, earnings persistence and accounting conservatism) with a construct of observed earnings quality by equity investors, which is represented by several indicators of equity investor's responsiveness to accounting information. We present the results from the double step of validation of PLS both at each latent variable as measured by its indicator (measurement model) and between latent variables (structural model), as previously described in section 3.2.3. Next, we compare the estimation power of PLS method as opposed to single-indicator approach both in sample and out of sample. We also compare the bias in earnings quality estimation (in terms of absolute value of residuals) of both PLS and the methods previously used in literature (single indicator, ranking of proxies and common factor).

The results from the measurement model provide some valuable information regarding earnings quality measurement. Thus, results show that the empirical proxies of both accruals quality construct and earnings smoothing construct used in previous literature do represent accurately their respective earnings dimensions. The analysis of the proxies that are expected to represent persistence, however, show that most of its indicators represent persistence appropriately but the indicator measuring the variance of earnings is more representative of earnings smoothing than of persistence. Regarding the fourth earnings property, results do not support that the empirical proxies of conservatism are representing a single and unique concept. Moreover, this concept is not distinguishable from other dimensions of earnings quality neither after depurating the model deleting the indicators that do not represent appropriately their latent variables.

With respect to the dependent variable, the results show that the only two proxies that represent appropriately the perceived extent of earnings quality by equity investors are the coefficients of book value and earnings regressed on price. The indicators from the Earnings Response Coefficient (hereafter, ERC) model, however, are not representative of perceived earnings quality.

Results from the structural model valuation also provide empirical evidence that the properties defining earnings quality are not explaining a high amount of the perceived level of earnings quality, as should be expected. Among the properties, it is noteworthy how persistence shows a considerably higher predictive power (both in-sample and out-of-sample) to explain perceived level of earnings quality by equity investors in comparison with accruals quality, smoothing and conservatism. Notwithstanding its higher predictive power, persistence has not been widely adopted in prior literature, as shown in Chapter 2, by the lower amount of papers considering persistence as the representative dimension of earnings quality. Other properties more commonly used in prior literature as conservatism and, specially, accruals quality, however, show a much lower predictive power to explain earnings quality outcomes.

All these things considered, new opportunities for further research arise to improve earnings quality measurement. Firstly, there is the challenge to develop new proxies that appropriately represent conservatism. Secondly, future studies could consider the possibility of including persistence as a good property to represent earnings quality. Finally, although accruals quality is appropriately measured it is the property with a lesser predictive power to explain perceived earnings quality by equity investors. For that reason, it should be included but appropriately weighted according to its lower importance in the explanation of earnings quality outcomes.

This Chapter is structured as follows. Section 4.1 presents the research design of the model for measuring earnings quality using the PLS method. Section 4.2 presents an overview of the main descriptive statistics and correlations among the different proxies for each of the latent variables (dimensions) in the model. Section 4.3 presents the results for measurement validity of each dimension, both at the indicator level (each proxy) and at the latent variable level (several proxies defining each latent variable). Section 4.4 analyses the discriminant validity of the constructs to check whether there are actually distinguishable from each other. Section 4.5 analyses the advantages of PLS over previous techniques in literature for earnings quality estimation in terms of in-sample and out-of-sample predictive power as well as estimation bias. Section 4.6 analyses whether a construct of earnings quality can be considered rather than the mere existence of several properties of accounting information. Section 4.7 includes additional analyses for the importance and performance of the main proxies of earnings quality as well as robustness tests of unobserved heterogeneity. Section 4.8 concludes.

4.1. RESEARCH DESIGN.

As explained before, to empirically validate the measurement of earnings quality we will design a MIMIC model using the PLS method connecting the determinants of earnings quality with its outcomes. This serves as a validation scale instrument (Diamantopoulos & Winklhofer, 2001). Such model will be applied to archival data of accounting information. In this section we first explain in details the earnings quality model that will be estimated with the PLS method as well as the definition of all variables . Later, wedescribe the sample selection process to collect the archival data.

4.1.1- Definition of the model and the variables.

Model design.

According to the framework for measuring earnings quality discussed in Chapter 3, we present the design of the model to be tested. Figure 6 depicts this model. Next, we desribe the strutural and the two measurement parts of the model.

FIGURE 6: ESTIMATION MODEL.

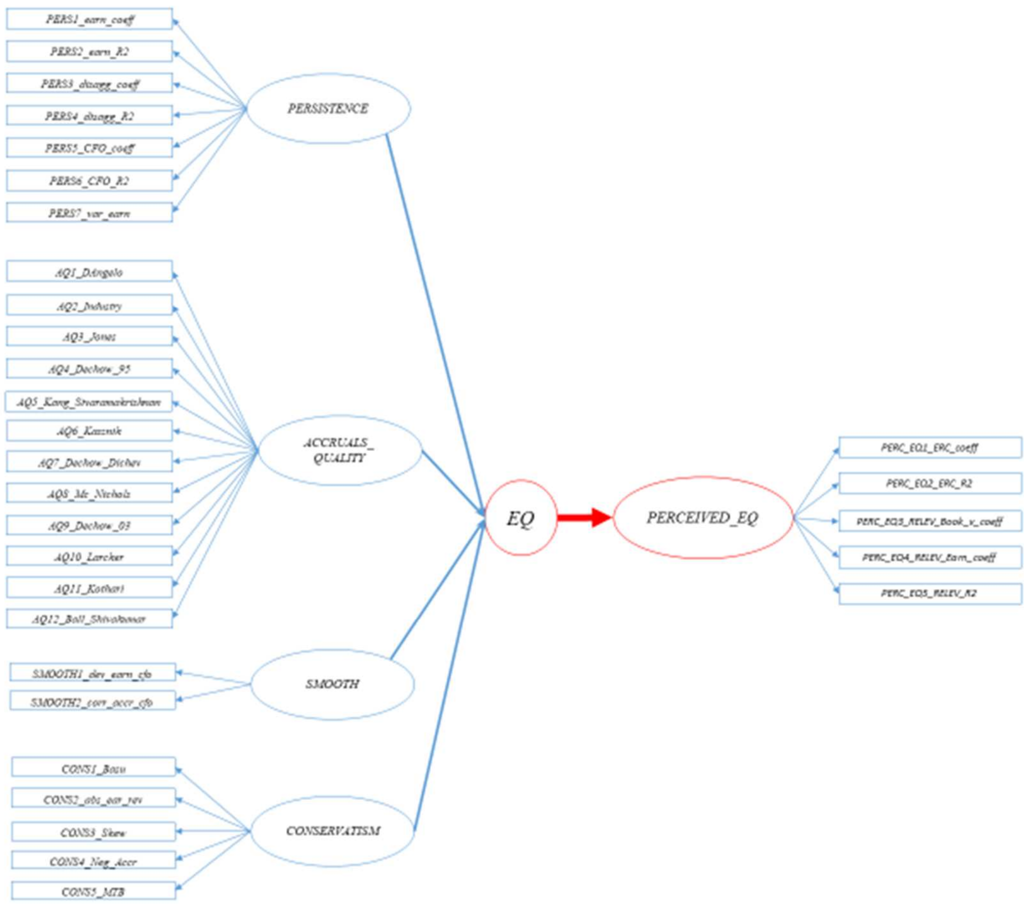


Figure 6 represents the estimation model using Partial Least Squares. Measurement model connects the theoretical concepts (latent variables, represented in circles) with the main proxies in prior literature that empirically measure them (indicator variables, represented in rectangles; all indicators are defined in Appendix C). All latent variables in measurement model are reflective because indicators are a consequence (reflection) of the theoretical variable they are linked to. Structural model connects latent variables to each other. The four exogenous variables are earnings properties that are indicative of earnings quality (accruals quality, smoothing, persistence and conservatism) and are the first-order constructs that define the second-order construct of earnings quality. The endogenous variable is expected outcomes of earnings quality (investor responsiveness of accounting information). In the structural model, relationship is formative because earnings quality is expected to determine the outcome in terms of investor responsiveness to accounting information.

Structural model

The structural model estimates the influence of the *Earnings Quality (EQ)* construct on the *Earnings Quality perceived by Equity Investors (PERCEIVED_EQ)* construct. That is to say, we analyse how the combination of different earnings properties that are expected to increase the usefulness of the earnings figure for decision making influence the perception of earnings quality of equity investors. Then, the independent variable (*Earnings Quality* construct) is measured using a formative model based on several earnings properties, whereas the dependent variable (*Earnings Quality perceived by Equity Investors* construct) is reflectively measured using metrics that are expected to be associated to the earnings quality perceptions of these decision makers. Next, we review the measurement models of these two variables.

Dependent variable.

The dependent variable is the *Earnings Quality perceived by Equity Investors* (*PERCEIVED_EQ*) construct. This variable is intended to measure the reactions of equity investors to the earnings quality level. It is, hence, a non-directly observable concept, and it is measured using several empirical proxies that prior literature has considered that represent equity investors' reactions to earnings quality. A detail of these proxies is also shown in Appendix C.

Independent variable.

The independent variable is a second-order. More specifically, it is the second-order construct of a reflective-formative measurement model (Becker et al., 2012; Chin, 1998; Jarvis et al., 2003; Li, Niu, Zhang, & Largay, 2011; Ringle et al., 2012; Wetzels & Odkerken-Schröder, 2009): The first-order constructs are related to their indicators in a reflective way, whereas first-order constructs are related in a formative way with the second-order construct (earnings quality)

In the first level, as conceptual variables we include the different properties of accounting information that determine the overall extent of earnings quality (Dechow et al., 2010): accruals quality *(ACCRUALS_QUALITY)*, earnings smoothing *(SMOOTH)*, persistence *(PERSISTENCE)* and conservatism *(CONSERVATISM)*. For representing these earnings properties, we used the most common empirical proxies used in previous research for measuring them. Appendix C reports the details on all the proxies

4.1.2 Sample selection.

For the analysis of the validity of earnings quality proxies, we have collected archival accounting data from listed firms between 1970 and 2016. Data are collected from Standard and Poor's Compustat, whereas market data (i.e. returns) are collected from the Center for Research in Security Prices (CRSP). The sample is restricted to non-financial firms, thereby deleting from the database those firms whose SIC-Code is included in the interval 6000 to 6999. The reason is that in financial frms it is not clear the differentiation between financing and operating activities (Richardson, Sloan, Soliman, & Tuna, 2005), thereby difficulting the estimation of some indicators such as the proxies for accruals quality.

According previous literature, we dropped observations with share price lower than one dollar or with negative book value (Basu, 1997; Beaver & Ryan, 2000; Khan & Watts, 2009). We also deleted data from those firms with lack of data for any of the variables used to calculate the different proxies (Dechow & Dichev, 2002; Francis et al., 2004; Richardson et al., 2005). In addition we require at least 10 firm-year observations in any two-digit SIC Code in any given year of the database items (Kothari et al., 2005) that are necessary to calculate the proxies that will be indicators of the different latent variables in the model.

Finally, about the treatment of outliers in our sample, we winsorize all variables at 1% and 99%. This allows for a control of outliers without trimming the sample and deleting more observations.

A more detailed analysis of the number of observations for the estimation of the different proxies by earnings properties is shown in Table 8.

TABLE 8 SAMPLE SELECTION

Compustat database:	
Observations in Compustat (annual data)	436,686
- Financial firms	129,880
Number observations non-financial firms	306,806
- Repeated values	351
Final nº observations Compustat for merge	306,455
CRSP database:	
Observations in CRSP (monthly data)	3,755,557
- Financial firms	1,016,703
Number observations non-financial firms	2,738,854
- Firms with more or less than 12 observations per year	432,502
Final nº observations CRSP for merge	2,306,352
Merge Compustat with CRSP:	
Observations after merge Compustat-CRSP	160,826
- Repeated values	259
Final nº observations for analysis	160,567
- Lack of observations for any of the estimated variables	142,129
Final nº observations after estimation	**18,438**

Table 8 shows sample selection process. Column 1 represents the step of the process of calculation of the indicators (proxies). Columns 2 represent the total number of observations after each step of the process.

NOTE: The table indicates the total number of observations before merging Compustat database (annual data) with CRSP database (monthly data), as well as the total number of observations after merging the two databases (annual data). These databases include data from firms, excluding financial firms (firms with SIC-Code 6000 to 6999).

4.2. DESCRIPTIVE STATISTICS.

Table 9 shows a detailed summary of the descriptive statistics (Panel A) as well as the correlation matrix (Panel B) of all the indicators. As it can be observed, the mean values of the different indicators are in line with those reported in previous research, considering a time-series approach[19].

TABLE 9 DESCRIPTIVE STATISTICS

PANEL A: DESCRIPTIVE STATISTICS

Indicators	*N*	*mean*	*sd*	*p25*	*p50*	*p75*
AQ1_DAngelo	18,438	-0.049	0.051	-0.064	-0.033	-0.015
AQ2_Industry	18,438	-0.041	0.049	-0.052	-0.025	-0.011
AQ3_Jones	18,438	-0.044	0.046	-0.059	-0.030	-0.014
AQ4_Dechow_95	18,438	-0.046	0.048	-0.061	-0.031	-0.014
AQ5_Kang_Sivaramakrishnan	18,438	-0.101	0.092	-0.144	-0.076	-0.034
AQ6_Kasznik	18,438	-0.039	0.040	-0.051	-0.027	-0.012
AQ7_Dechow_Dichev	18,438	-0.036	0.040	-0.046	-0.024	-0.010
AQ8_Mc_Nichols	18,438	-0.031	0.034	-0.041	-0.021	-0.010
AQ9_Dechow_03	18,438	-0.045	0.047	-0.061	-0.031	-0.014
AQ10_Larcker	18,438	-0.040	0.042	-0.053	-0.027	-0.012
AQ11_Kothari	18,438	-0.045	0.047	-0.060	-0.031	-0.014
AQ12_Ball_Shivakumar	18,438	-0.049	0.046	-0.059	-0.037	-0.016
CONS1_Basu	18,438	0.118	3.085	-0.096	0.020	0.189
CONS2_abs_ear_rev	18,438	2.317	12.580	0.565	1.381	2.275
CONS3_Skew	18,438	-0.277	0.836	-0.806	-0.244	0.262
CONS4_Neg_Accr	18,438	-0.334	0.400	-0.561	-0.334	-0.113
CONS5_MTB	18,438	2.496	2.520	1.164	1.833	2.924
PERC_EQ1_ERC_coeff	18,438	0.050	0.415	-0.002	0.004	0.042
PERC_EQ2_ERC_R2	18,438	0.395	0.255	0.176	0.367	0.588
PERC_EQ3_RELEV_Book_v_coeff	18,438	0.823	2.779	-0.186	0.761	1.847
PERC_EQ4_RELEV_Earn_coeff	18,438	3.998	9.508	0.225	2.205	6.036
PERC_EQ5_RELEV_R2	18,438	0.523	0.255	0.324	0.543	0.734
PERS1_earn_coeff	18,438	0.364	0.364	0.130	0.377	0.593
PERS2_earn_R2	18,438	0.227	0.222	0.039	0.158	0.362
PERS3_disagg_coeff	18,438	0.372	0.500	0.093	0.363	0.637
PERS4_disagg_R2	18,438	0.332	0.229	0.138	0.296	0.495
PERS5_CFO_coeff	18,438	0.135	0.730	-0.162	0.169	0.519
PERS6_CFO_R2	18,438	0.176	0.195	0.023	0.100	0.274
PERS7_var_earn	18438	-0.006	0.013	-0.006	-0.002	-0.001
SMOOTH1_dev_earn_cfo	18,438	0.907	0.480	0.543	0.818	1.145
SMOOTH2_corr_accr_cfo	18,438	-0.545	0.390	-0.862	-0.653	-0.321

---

[19] In the case of the Basu proxy for conditional conservatism, the mean value is lower than in model of Basu (1997) but it close to other papers as Givoly et al. (2007).

TABLE 9: DESCRIPTIVE STATISTICS (CONTINUED)

PANEL B: CORRELATION MATRIX

CORRELATIONS FOR PERCEIVED EARNINGS QUALITY INDICATORS

	PERC_EQ1_ERC_coeff	*PERC_EQ2_ERC_R2*	*PERC_EQ3_RELEV_Book_v_coeff*	*PERC_EQ4_RELEV_Earn_coeff*	*PERC_EQ5_RELEV_R2*
PERC_EQ1_ERC_coeff	1.000				
PERC_EQ2_ERC_R2	0.033*	1.000			
PERC_EQ3_RELEV_Book_v_coeff	0.019*	-0.005	1.000		
PERC_EQ4_RELEV_Earn_coeff	0.038*	0.092*	-0.548*	1.000	
PERC_EQ5_RELEV_R2	0.009	0.141*	0.206*	0.143*	1.000

CORRELATIONS FOR PERSISTENCE INDICATORS

	PERS1_earn_coeff	*PERS2_earn_R2*	*PERS3_disagg_coeff*	*PERS4_disagg_R2*	*PERS5_CFO_coeff*	*PERS6_CFO_R2*	*PERS7_var_earn*
PERS1_earn_coeff	1.000						
PERS2_earn_R2	0.753*	1.000					
PERS3_disagg_coeff	0.497*	0.382*	1.000				
PERS4_disagg_R2	0.479*	0.623*	0.452*	1.000			
PERS5_CFO_coeff	0.292*	0.281*	0.114*	0.165*	1.000		
PERS6_CFO_R2	0.272*	0.375*	0.129*	0.244*	0.242*	1.000	
PERS7_var_earn	0.067*	0.039*	-0.047*	-0.015*	-0.040*	-0.091*	1.000

TABLE 9: DESCRIPTIVE STATISTICS (CONTINUED)

CORRELATIONS FOR ACCRUALS QUALITY INDICATORS

	AQ1_DAngelo	*AQ2_Industry*	*AQ3_Jones*	*AQ4_Dechow_95*	*AQ5_Kang_Sivaramakrishnan*	*AQ6_Kasznik*	*AQ7_Dechow_Dichev*	*AQ8_Mc_Nichols*	*AQ9_Dechow_03*	*AQ10_Larcker*	*AQ11_Kothari*	*AQ12_Ball_Shivakumar*
AQ1_DAngelo	1.000											
AQ2_Industry	0.844*	1.000										
AQ3_Jones	0.789*	0.732*	1.000									
AQ4_Dechow_95	0.834*	0.770*	0.973*	1.000								
AQ5_Kang_Sivaramakrishnan	0.293*	0.246*	0.271*	0.286*	1.000							
AQ6_Kasznik	0.656*	0.597*	0.832*	0.808*	0.261*	1.000						
AQ7_Dechow_Dichev	0.609*	0.576*	0.526*	0.566*	0.266*	0.560*	1.000					
AQ8_Mc_Nichols	0.512*	0.487*	0.578*	0.571*	0.225*	0.665*	0.799*	1.000				
AQ9_Dechow_03	0.862*	0.760*	0.922*	0.936*	0.288*	0.775*	0.548*	0.564*	1.000			
AQ10_Larcker	0.715*	0.665*	0.825*	0.845*	0.267*	0.805*	0.591*	0.632*	0.799*	1.000		
AQ11_Kothari	0.814*	0.754*	0.940*	0.964*	0.281*	0.798*	0.556*	0.564*	0.911*	0.817*	1.000	
AQ12_Ball_Shivakumar	-0.010	-0.015	0.007	0.003	-0.004	0.010	0.010	0.014	0.000	0.011	0.003	1.000

CORRELATIONS FOR SMOOTHING INDICATORS

	SMOOTH1_dev_earn_cfo	*SMOOTH2_corr_accr_cfo*
SMOOTH1_dev_earn_cfo	1.000	
SMOOTH2_corr_accr_cfo	0.449*	1.000

TABLE 9: DESCRIPTIVE STATISTICS (CONTINUED)

CORRELATIONS FOR CONSERVATISM INDICATORS

	CONS1_Basu	*CONS2_abs_ear_rev*	*CONS3_Skew*	*CONS4_Neg_Accr*	*CONS5_MTB*
CONS1_Basu	1.000				
CONS2_abs_ear_rev	-0.004	1.000			
CONS3_Skew	-0.032*	-0.020*	1.000		
CONS4_Neg_Accr	-0.002	-0.009	0.043*	1.000	
CONS5_MTB	-0.009	0.010	-0.001	-0.080	1.000

Table 9 shows descriptive statistics for all of the indicator variables. These variables are the proxies for the different endogenous and exogenous variables in the model. All variables are defined in Appendix C. Panel A presents the basic descriptive statistics in five columns: Column 1 shows the mean value. Column 2 shows the standard deviation of the variable. Columns 3, 4 and 5 show the main percentiles (25, 50 and 75, respectively). Panel B presents the correlation matrices of the indicators for each of the constructs that have been defined in Appendix C. NOTE: The star (*) indicates that this correlation is statistically significant at 5% level.

Regarding the correlation matrix (Panel B), in the indicators that proxy for perceived earnings quality by investors, the correlation is not very high for *PERC_EQ1_ERC_coeff* and *PERC_EQ2_ERC_R2* with the rest of indicators, with values ranging from -0.005 to 0.141. For the indicators measuring persistence it can be observed that the proxies are positive, with values ranging from 0.114 to 0.753, being the indicators estimated with the earnings persistence model (*PERS1_earn_coeff* and *PERS2_earn_R2*) the ones with better correlations with the rest of indicators. However, it is noteworthy the low correlation among the variance of earnings (*PERS7_var_earn*) and the rest of proxies for persistence, even with negative values ranging from -0.091 to 0.067. The correlations among the accruals quality indicators are mostly high, with values ranging between 0.7 and 0.9, approximately. *AQ5_Kang_Sivaramakrishnan* shows a smaller correlation with the other proxies, being around 0.25. *AQ12_Ball_S*, however, exhibits correlations that are quite near to zero with all the other proxies. For earnings smoothing, the two proxies have a correlation of 0.45. Finally, the correlations among the different conservatism metrics are quite near to zero, being even negative for some cases. These low correlations are, however, in line with concerns in prior literature about that the different proxies for conservatism are not measuring a single and clear theoretical concept (Wang, Hogartaigh, & Van Ziji, 2009) and with empirical papers that have proved the low or even negative correlation between some of them (Givoly et al., 2007; Ryan, 2006; Wang et al., 2009).

Next, we analyse the results from the estimation of the model using Partial Least Squares. Subsections 4.3 to 4.5 analyse the validity of the first-order earnings properties constructs. Subsection 4.6 assesses the validity of the higher-order construct earnings quality.

4.3 RESULTS FOR MEASUREMENT VALIDITY.

In this section, we analyse the validity of the measurement models, both of each proxy individually considered as well as the different proxies aggregately explaining the same theoretical dimensions of earnings quality.

This analysis is presented for each latent variable individually considered. For each one of these latent variables, we display three blocks of results. Firstly, we report the outer loadings for each individual indicator. The analysis of the magnitude of these outer loadings indicates whether each proxy individually considered is an appropriate representation of the theoretical concept it aims to explain. Secondly, the values of the composite reliability index for each construct are presented. This index indicates whether the proxies, considered aggregately, represent appropriately the same theoretical dimension. In other words, it clarifies if the value for each dimension is representative of the conjunct of proxies measuring it. Finally, we report the Average Variance Extracted (AVE) for the convergent validity assessment. AVE indicates whether the latent variable is able to explain a sufficient proportion of the average variance of its indicators relative to the overall variance of these indicators

To ensure that we are using valid constructs of the different earnings quality proxies, the three former measures have to be evaluated (Hair et al., 2017, 2016). Thus, at the individual indicator level, it is necessary to check if each indicator is appropriately representing its associated latent variable. Previous researchers indicate that loadings above 0.7 show that the indicator is representing properly its associated construct (Carmines & Zeller, 1979). Notwithstanding this, for loadings between 0.4 and 0.7, the researcher can consider to maintain them if the construct reliability and validity of the concept they measure is not affected (Chin, 1998; Hair et al., 2011; Hair, Tomas, et al., 2016; Roldán & Sánchez-Franco, 2012). Values for loadings below 0.4 indicate that the indicator is not able to empirically represent the concept (Hair et al., 2011; Henseler et al., 2009; Roldán & Sánchez-Franco, 2012) and must be, thus, deleted from the model. At the latent variable level, when aggregating the indicators that empirically represent it, these indicators should measure the same variable (composite reliability), explaining a sufficient proportion of its behaviour (AVE). For construct reliability, the minimum value for composite reliability index should be 0.7. For construct validity, AVE should be at least 0.5.

According to aforementioned rules, we have applied the following process for depurating our constructs. We first estimated the model using all the indicators listed in Appendix C. This model including all the indicators is our original model. After estimating the model, we removed those indicators that did not represent accurately their associated latent variable. To decide which indicator should be removed from the model, we ordered the loadings of all the indicators and removed the one with the smallest value. After dropping that indicator, the model was estimated again. This process was repeated till the following conditions were met: 1) The loading of all the remaining indicators exceeded the minimum 0.4.; 2) The composite reliability index exceeded the minimum 0.7. And 3) the AVE for all the latent variables was higher than 0.5. Results are reported presenting the estimates of the original model (that with all the indicators) and the final model (that for which the three conditions were met). For the sake of brevity, we do not report the results of the intermediate steps.

Next, we discuss the results of the validity tests for the different latent variables. We start with the analysis of the validity of the dependent variable (*PERCEIVED_EQ*) and, next, we discuss the validity of the four earnings properties persistence (*PERSISTENCE*), accruals quality (*ACCRUALS_QUALITY*), earnings smoothing (*SMOOTH*) and conservatism (*CONSERVATISM*).

4.3.1 Validity of the Dependent variable.

Table 10 displays the results for the validity analysis of the dependent variable, which is the earnings quality perceived by investors (*PERCEIVED_EQ*). Panel A reports the results of the original model (using all the indicators) whereas Panel B presents the results with the indicators that remain after removing those measures that did not represent accurately the latent variable.

TABLE 10: CONSTRUCT VALIDATION. INDIVIDUAL INDICATOR RELIABILITY AND CONSTRUCT RELIABILITY AND VALIDITY FOR PERCEIVED EARNINGS QUALITY.

PANEL A: ORIGINAL SITUATION

	Indicator loadings	Composite reliability	AVE
Perceived Earnings Quality construct (*PERCEIVED_EQ*)		0.594	0.292
PERC_EQ1_ERC_coeff	0.150		
PERC_EQ2_ERC_R2	0.192		
PERC_EQ3_RELEV_Book_v_coeff	0.642		
PERC_EQ4_RELEV_Earn_coeff	0.924		
PERC_EQ5_RELEV_R2	0.368		

PANEL B: FINAL SITUATION

	Indicator loadings	Composite reliability	AVE
Perceived Earnings Quality construct (*PERCEIVED_EQ*)		0.865	0.764
PERC_EQ3_RELEV_Book_v_coeff	0.807		
PERC_EQ4_RELEV_Earn_coeff	0.936		

Table 10 shows the results from the Partial Least Squares regression of the construct measurement validation for the latent variable representing earnings quality as perceived by investors (*PERCEIVED_EQ*). The table is divided into two panels. Panel A corresponds to the original model (including all the indicators). Panel B corresponds to the final model (after deleting those indicators that were not valid representations of their associated latent variable). Each panel is divided into four columns: Column 1 shows the name of the latent variables/indicators. Column 2 shows the values for the indicator loadings. Column 3 exhibits the value for the composite reliability index. Column 4 indicates the Average Variance Extracted (AVE). NOTE: Columns 3 and 4 correspond to the construct (latent variable) while Column 1 corresponds to the indicators. All the indicator variables are described in Appendix C.

To begin with, the indicator *V_RELEV1_Book_v_coeff* exhibits a high, negative loading (-0.642) for the original model. This value indicates a strong relationship between the latent variable and the indicator, but with a sign opposite to expected. Given that we are considering that indicators have to be positively related to earnings quality, we changed the computation of *V_RELEV1_Book_v_coeff*, calculating it as the coefficient for book value in the value relevance model multiplied by -1. Hence, all the further results from the PLS estimation, both for the measurement and the structural model, are derived from taking this additive inverse for *V_RELEV1_Book_v_coeff*.

In the original model, there are three indicators with values below 0.4: *PERC_EQ1_ERC_coeff*, *PERC_EQ2_ERC_R2*, and *PERC_EQ5_RELEV_R2*. Hence, neither the proxies for the Earnings Response Coefficient nor the R^2 from the model of value relevance of accounting information are sufficiently correlated with the common, aggregated representation of the extent of earnings quality as perceived by investors. Actually, in this original situation, the low correlation for these indicators with the construct makes that the aggregated measure is not representative of all of its indicators (composite reliability index = 0.594) and that those indicators are not able to explain a sufficient amount of the behavior of perceived earnings quality (AVE = 0.292),

The former three indicators were therefore removed from the model, remaining only two indicators in the final model: *PERC_EQ3_RELEV_Book_v_coeff* and *PERC_EQ4_RELEV_Earn_coeff*, both taken from the value relevance model. The loadings for these two indicators exceed the minimum value of 0.7, and the metrics for the reliability of the construct also reach the minimum values (composite reliability = 0.865; AVE = 0.765).

4.3.2- Persistence measurement validity.

The results for the validity analysis of the persistence latent variable (*PERSISTENCE*). We present results for the original model (Panel A) and the final model after the depurative process of PLS (Panel B) in Table 11.

TABLE 11: CONSTRUCT VALIDATION. INDIVIDUAL INDICATOR RELIABILITY AND CONSTRUCT RELIABILITY AND VALIDITY FOR PERSISTENCE

PANEL A: ORIGINAL SITUATION

	Indicator loadings	Composite reliability	AVE
Persistence construct (*PERSISTENCE*)		0.797	0.401
PERS1_earn_coeff	0.862		
PERS2_earn_R2	0.907		
PERS3_disagg_coeff	0.553		
PERS4_disagg_R2	0.750		
PERS5_CFO_coeff	0.367		
PERS6_CFO_R2	0.457		
PERS7_var_earn	0.168		

PANEL B: FINAL SITUATION

	Indicator loadings	Composite reliability	AVE
Persistence construct (*PERSISTENCE*)		0.852	0.547
PERS1_earn_coeff	0.858		
PERS2_earn_R2	0.914		
PERS3_disagg_coeff	0.574		
PERS4_disagg_R2	0.773		
PERS6_CFO_R2	0.487		

Table 11 shows the results from the Partial Least Squares regression of the construct measurement validation for the latent variable representing persistence (*PERSISTENCE*). The table is divided into two panels. Panel A corresponds to the original model (including all the indicators). Panel B corresponds to the final model (after deleting those indicators that were not valid representations of their associated latent variable). Each panel is divided into four columns: Column 1 shows the name of the latent variables/indicators. Column 2 shows the values for the indicator loadings. Column 3 exhibits the value for the composite reliability index. Column 4 indicates the Average Variance Extracted (AVE). NOTE: Columns 3 and 4 correspond to the construct (latent variable) while Column 1 corresponds to the indicators. All the indicator variables are described in Appendix C

Results shown in Panel A indicate that there is no evidence of problems in most of the persistence indicators. There are three indicators with loadings above 0.7: *PERS1_earn_coeff* (loading = 0.862), *PERS2_earn_R2* (loading = 0.907) and *PERS4_disagg_R2* (loading = 0.750). Additionally, two of the indicators show loadings between 0.4 and 0.7 (*PERS3_disagg_coeff* (loading = 0.553) and *PERS6_CFO_R2* (loading = 0.457)), for which we will have to evaluate whether they affect construct reliability and validity to decide whether these indicators should be maintained or removed in the model.

After the iterative depurative process, the two indicators with loadings below 0.4 in the original model (*PRED7_var_earn* and *PERS5_CFO_coeff*) were deleted. With respect to *PERS6_CFO_R2*, although the loading remains below 0.7 after the depuration, we kept it because both construct reliability (composite reliability index = 0.852) and validity (AVE = 0.547) meet the thresholds.

4.3.3- Accruals-quality measurement validity.

The second of the earnings properties for which we analyse measurement validity is accruals quality (*ACCRUALS_QUALITY*). Results are presented in Table 12, both in the original model (Panel A) and after depurating the model with the PLS scale validation technique (Panel B).

TABLE 12: CONSTRUCT VALIDATION. INDIVIDUAL INDICATOR RELIABILITY AND CONSTRUCT RELIABILITY AND VALIDITY FOR ACCRUALS QUALITY

PANEL A: ORIGINAL SITUATION.

	Indicator loadings	Composite reliability	AVE
Accruals quality (*ACCRUALS_QUALITY*) construct:		0.950	0.641
AQ1_DAngelo	0.879		
AQ2_Industry	0.823		
AQ3_Jones	0.943		
AQ4_Dechow_95	0.959		
AQ5_Kang_Sivaramakrishnan	0.321		
AQ6_Kasznik	0.871		
AQ7_Dechow_Dichev	0.710		
AQ8_Mc_Nichols	0.720		
AQ9_Dechow_03	0.936		
AQ10_Larcker	0.890		
AQ11_Kothari	0.941		
AQ12_Ball_Shivakumar	0.01		

TABLE 12: CONSTRUCT VALIDATION. INDIVIDUAL INDICATOR RELIABILITY AND CONSTRUCT RELIABILITY AND VALIDITY FOR ACCRUALS QUALITY (Continued).

PANEL B: FINAL SITUATION

	Indicator loadings	Composite reliability	AVE
Accruals quality (*ACCRUALS_QUALITY*) construct:		0.969	0.759
AQ1_DAngelo	0.879		
AQ2_Industry	0.823		
AQ3_Jones	0.944		
AQ4_Dechow_95	0.960		
AQ6_Kasznik	0.871		
AQ7_Dechow_Dichev	0.708		
AQ8_Mc_Nichols	0.718		
AQ9_Dechow_03	0.936		
AQ10_Larcker	0.891		
AQ11_Kothari	0.941		

Table 12 shows the results from the Partial Least Squares regression of the construct measurement validation for the latent variable representing accruals quality (*ACCRUALS_QUALITY*). The table is divided into two panels. Panel A corresponds to the original model (including all the indicators). Panel B corresponds to the final model (after deleting those indicators that were not valid representations of their associated latent variable). Each panel is divided into four columns: Column 1 shows the name of the latent variables/indicators. Column 2 shows the values for the indicator loadings. Column 3 exhibits the value for the composite reliability index. Column 4 indicates the Average Variance Extracted (AVE). NOTE: Columns 3 and 4 correspond to the construct (latent variable) while Column 1 corresponds to the indicators. All the indicator variables are described in Appendix C

In broad terms, we can observe in Panel A that most of the indicators are representing the same theoretical concept, as evidenced by the high magnitude of indicator loadings (ranging from 0.710 to 0.959). Two of the indicators, however, (*AQ5_Kang_Sivaramakrishnan* and *AQ12_Ball_Shivakumar*) do not meet the threshold to be considered individually a good representation of the concept they measure, as they have a loading below 0.4 (0.321 and 0.010, respectively). Regarding the aggregate representation of *ACCRUALS_QUALITY*, results support the validity of the latent variable, as shown by a high composite reliability index (0.950) and high averagevariance extracted (AVE = 0.641).

After the depuration of the model, *AQ5_Kang_Sivaramakrishnan* and *AQ12_Ball_Shivakumar* were deleted, slightly increasing the construct reliability and validity (0.969 and 0.759 respectively).

4.3.4- Earnings-smoothing measurement validity.

We continue with the analysis of measurement validity for the accounting properties of earnings with the latent variable representing earnings smoothing (*SMOOTH*). Results are presented in Table 13 for both the original model (Panel A) and the depurated model after dropping indicators (Panel B).

TABLE 13: CONSTRUCT VALIDATION. INDIVIDUAL INDICATOR RELIABILITY AND CONSTRUCT RELIABILITY AND VALIDITY FOR EARNINGS SMOOTHING

PANEL A: ORIGINAL SITUATION.

	Indicator loadings	Composite reliability	AVE
Earnings smoothing (*SMOOTH*) construct:		0.838	0.721
SMOOTH1_dev_earn_cfo	0.891		
SMOOTH2_corr_accr_cfo	0.805		

PANEL B: FINAL SITUATION.

	Indicator loadings	Composite reliability	AVE
Earnings smoothing (*SMOOTH*) construct:		0.837	0.721
SMOOTH1_dev_earn_cfo	0.895		
SMOOTH2_corr_accr_cfo	0.800		

Table 13 shows the results from the Partial Least Squares regression of the construct measurement validation for the latent variable representing earnings smoothing (*SMOOTH*). The table is divided into two panels. Panel A corresponds to the original model (including all the indicators). Panel B corresponds to the final model (after deleting those indicators that were not valid representations of their associated latent variable). Each panel is divided into four columns: Column 1 shows the name of the latent variables/indicators. Column 2 shows the values for the indicator loadings. Column 3 exhibits the value for the composite reliability index. Column 4 indicates the Average Variance Extracted (AVE). NOTE: Columns 3 and 4 correspond to the construct (latent variable) while Column 1 corresponds to the indicators. All the indicator variables are described in Appendix C

Results show that the two proxies used in prior literature do represent the same theoretical concept. This is evidenced by the high indicator loadings (even above 0.7), as well as the values of the composite reliability (0.837) and the average variance extracted (0.721). After depurating the model, both two indicators remain, with no significant changes in the construct reliability and validity.

4.3.5 Conservatism measurement validity.

We conclude the analysis of measurement validity for the accounting properties of earnings with the latent variable representing the extent of conservatism (*CONSERVATISM*). Results for *CONSERVATISM* measurement validity are presented in Table 14 for the original (Panel A) and depurated (Panel B) models.

TABLE 14: CONSTRUCT VALIDATION. INDIVIDUAL INDICATOR RELIABILITY AND CONSTRUCT RELIABILITY AND VALIDITY FOR CONSERVATISM

PANEL A: ORIGINAL SITUATION.

	Indicator loadings	Composite reliability	AVE
Conservatism (*CONSERVATISM*) construct:		0.334	0.168
CONS1_Basu	-0.07		
CONS2_abs_ear_rev	0.220		
CONS3_Skew	0.852		
CONS4_Neg_Accr	0.201		
CONS5_MTB	0.422		

PANEL B: FINAL SITUATION.

	Indicator loadings	Composite reliability	AVE
Conservatism (*CONSERVATISM*) construct:		1	1
CONS3_Skew	1		

Table 14 shows the results from the Partial Least Squares regression of the construct measurement validation for the latent variable representing conservatism (*CONSERVATISM*). The table is divided into two panels. Panel A corresponds to the original model (including all the indicators). Panel B corresponds to the final model (after deleting those indicators that were not valid representations of their associated latent variable). Each panel is divided into four columns: Column 1 shows the name of the latent variables/indicators. Column 2 shows the values for the indicator loadings. Column 3 exhibits the value for the composite reliability index. Column 4 indicates the Average Variance Extracted (AVE). NOTE: Columns 3 and 4 correspond to the construct (latent variable) while Column 1 corresponds to the indicators. All the indicator variables are described in Appendix C

Results from measurement validity of *CONSERVATISM* evidence the existence of problems to empirically represent this theoretical concept. First of all, results reported in Panel A indicate that the different proxies used in prior literature to measure conservatism are not really representing a single, common concept. Actually, even at the individual indicator level we can observe how most of the proxies present too low loadings, being even negative in some cases. The only exception is *CONS3_Skew*, with an acceptable magnitude of its loading (0.852). These results provide empirical evidence that the proxies of conservatism are not measuring the same concept. We have to indicate, however, that our *CONS1_Basu* measure is estimated on a time-series basis, what can affect to the validity of these indicators as prior literature documents problems with the time-series estimation of these metrics (Artiach & Clarkson, 2011; Cano-Rodríguez & Nunez-Nickel, 2015; Givoly et al., 2007; Ryan, 2006; Wang et al., 2009).

Our results, then, confirm empirically the theoretical concerns that the research on conservatism has not been able to find a properly way of measuring it. Actually, prior literature highlights the low correlation between the different empirical measures of conservatism (Givoly et al., 2007; Ryan, 2006; Wang et al., 2009). Then, proxies in conservatism research have been focused only on certain aspects of conservatism and this focus on a single aspect does not provide accurate assessment of the overall extent of conservatism, especially when such aspects are not independent to each other (Givoly et al., 2007). Apart from the problem of the different theoretical views of conservatism, literature also points out that the lack of positive association between the proxies of conservatism is due to the existence of measurement errors in the estimation of the variables such as the omission of variables or the difficulties to settle a correct time window (Roychowdhury & Watts, 2007; Wang et al., 2009). Summing up, results for indicator loadings indicate that there is no group of proxies that appropriately reflect the concept individually considered. Our results are in line with several empirical works that evidence contradictions between the different aspects reflected by conservatism measures (Ball et al., 2000; Beaver & Ryan, 2005; Giner & Rees, 2001; Givoly et al., 2007; Roychowdhury & Watts, 2007; Wang et al., 2009).

Such heterogeneity observed in the low magnitude of the loadings reflects that each proxy is measuring a different concept. These concerns are confirmed when observing inacceptable values for aggregated, concept valuation (composite reliability index = 0.334 and AVE = 0.168).

After deleting indicators with too low loadings, only one final indicator remains: *CONS3_Skew*. During all the iterative process, construct reliability and validity did not meet the thresholds, eliminating subsequently the different indicators for *CONSERVATISM*. Given that this measure is represented by a single indicator, we must be cautious about the true nature of this construct, as we cannot properly speak about "conservatism" but just about a reflection of a specific aspect of conservative accounting practices (in this case, for *CONS3_Skew*, the observation of a greater skewness in the distribution of earnings). Then, from this point, when we talk about conservatism is considering such specific aspect.

Summing up, results of validation of individual proxies evidence the claimed lack of validity of the measures to reflect the extent of conservatism. This way, each proxy is measuring different concepts. Consequently, the main conclusion we can extract from empirical evidence is that it cannot be considered a single theoretical concept measured with several proxies but just different aspects denoting conservative practices in accounting recognition.

4.4-) RESULTS FOR DISCRIMINANT VALIDITY.

Discriminant validity analysis empirically tests whether the different latent variables actually represent different theoretical concepts or they represent the same concept. Additionally, it can be used to check if the different indicators are representing their associated latent variable better than the other latent variables in the model.

Tables 15, 16 and 17 (respectively) report the three main criteria used in prior literature to assess discriminant validity: cross loadings (Table 15), Fornell-Larcker criterion (Table 16), and the heterotrait-monotrait (HTMT) ratio (Table 17) The rules of thumb for these tests are the following: Loadings of the indicators must be higher for their associated construct than for any other construct (cross loadings criterion); the square root of AVE must be higher than the correlation among the indicators (Fornell and Larcker criterion); and HTMT must be below 0.9 (HTMT criterion).

Analysis of cross loadings

The analysis of the cross loadings of the indicators checks if a given indicator from the latent variables indicate the relationship between that indicator with all the latent variables. It is expected that the highest loading will be exhibited for the latent variable the indicator is associated to. A higher loading for any other latent variable would indicate that that indicator is representing better that other latent variable than its initially associated construct, and it would be advisable to change the association for that indicator. Table 15 presents the cross loadings for all the indicators.

TABLE 15. DISCRIMINANT VALIDITY. CROSS LOADINGS.

	PERCEIVED_EQ	*PERSISTENCE*	*ACCRUALS _QUALITY*	*SMOOTH*	*CONSERVATISM*
PERC_EQ3_RELEV_Book_v_coeff	**0.807**	0.095	0.014	-0.093	0.063
PERC_EQ4_RELEV_Earn_coeff	**0.936**	0.183	0.051	-0.086	0.112
PERS1_earn_coeff	0.151	**0.858**	0.04	-0.163	0.106
PERS2_earn_R2	0.168	**0.914**	0.049	-0.13	0.134
PERS3_disagg_coeff	0.05	**0.574**	0.012	0.038	-0.025
PERS4_disagg_R2	0.127	**0.773**	0.02	-0.094	0.074
PERS6_CFO_R2	0.076	**0.487**	0.052	0.092	0.053
AQ1_DAngelo	0.038	0.038	**0.879**	0.052	0.028
AQ2_Industry	0.032	0.031	**0.823**	0.049	0.033
AQ3_Jones	0.04	0.041	**0.944**	0.057	0.023
AQ4_Dechow_95	0.041	0.04	**0.96**	0.055	0.027
AQ6_Kasznik	0.042	0.049	**0.871**	-0.028	0.029
AQ7_Dechow_Dichev	0.028	0.047	**0.708**	-0.034	0.033
AQ8_Mc_Nichols	0.031	0.048	**0.718**	-0.034	0.033
AQ9_Dechow_03	0.037	0.04	**0.936**	0.059	0.029
AQ10_Larcker	0.039	0.04	**0.891**	-0.031	0.03
AQ11_Kothari	0.036	0.043	**0.941**	0.055	0.026
SMOOTH1_dev_earn_cfo	-0.095	-0.07	-0.01	**0.895**	-0.243
SMOOTH2_corr_accr_cfo	-0.071	-0.128	0.062	**0.8**	-0.02
CONS3_Skew	0.105	0.113	0.033	-0.173	**1**

Table 15 shows the results for the tests of discriminant validity from the Partial Least Squares regression with the cross loadings criterion. These results are taken from the final model after the deletion of indicators in the iterative, depurative process in the measurement model validation. Rows present the cross loadings for each indicator. Columns present the latent variables that are explained by each of these cross loadings: : accruals quality (*ACCRUALS_QUALITY*), conservatism (*CONSERVATISM*), perceived quality by equity investors (*PERCEIVED_EQ*), persistence (*PERSISTENCE*), and earnings smoothing (*SMOOTH*). All indicator and latent variables are defined in Appendix C. NOTE: We write in bold style the loadings from each indicator in the construct they are measuring.

Looking at the loadings shown in Table 15 we can check how, after the depurative process, all the indicators have a higher loading in the construct they measure. This demonstrates that these indicators represent empirically the latent variable they proxy for than the rest of latent variables in the model. In short, we can conclude that according to the cross-loading criterion all variables show an acceptable discriminant validity.

Analysis of the Fornell-Larcker criterion.

Results for the Fornell-Larcker criterion are presented in Table 16. These results are presented only for the final model after having depurated indicators in the construct measurement validity assessment.

TABLE 16. DISCRIMINANT VALIDITY. FORNELL-LARCKER CRITERION.

	EQ_PERCEIVED_INV	*CONSERVATISM*	*ACCRUALS_QUALITY*	*PERSISTENCE*	*SMOOTH*
EQ_PERCEIVED_INV	0.874				
CONSERVATISM	0.105	1			
ACCRUALS_QUALITY	0.042	0.033	0.871		
PERSISTENCE	0.169	0.113	0.048	0.74	
SMOOTH	-0.099	-0.173	0.024	-0.111	0.849

Table 16 shows the results for the tests of discriminant validity from the Partial Least Squares regression with the Fornell-Larcker criterion. These results are taken from the final model after the deletion of indicators in the iterative, depurative process in the measurement model validation. These panels are divided into six columns: Column 1 shows the latent variables representing the dimensions of earnings quality: accruals quality (*ACCRUALS_QUALITY*), conservatism (*CONSERVATISM*), perceived quality by equity investors (*PERCEIVED_EQ*), persistence (*PERSISTENCE*), and earnings smoothing (*SMOOTH*); Columns 2 to 6 present the latent variables for which we assess discriminant validity with respect to column 1. In this table, the value that is shown on the diagonal corresponds to the square root of the AVE of the analysed latent variable. The rest of the values indicate the correlation between the different pairs of latent variables. All variables are defined in Appendix C.

Analysing the Fornell-Larcker criterion (Panel B) we observe that all variables are distinct from the rest because the square root of the explained construct variance (AVE) is higher than the correlations with other constructs.

Analysis of the HTMT criterion.

Notwithstanding the results of acceptable discriminant validity for all variables from the Fornell-Larcker criteron, this criterion has been criticized in prior literature because of its tendency to accept the discriminant validity given that it tends to overestimate indicator loadings and underestimate structural model relationships (Dijkstra & Henseler, 2015; Henseler et al., 2012, 2015; Reinartz et al., 2009; Roldán & Sánchez-Franco, 2012). For that reason, a stricter and more appropriate criterion would be the the analysis of the HTMT (Hair et al., 2016; Henseler et al., 2015; Roldán & Sánchez-Franco, 2012). Results for this criterion criterion are shown in Table 17. These results are presented only for the final model after having depurated indicators in the construct measurement validity assessment.

TABLE 17. DISCRIMINANT VALIDITY. HTMT CRITERION.

	EQ_PERCEIVED_INV	*CONSERVATISM*	*ACCRUALS_QUALITY*	*PERSISTENCE*	*SMOOTH*
EQ_PERCEIVED_INV					
CONSERVATISM	0.619				
ACCRUALS_QUALITY	0.077	0.283			
PERSISTENCE	0.308	0.556	0.125		
SMOOTH	0.191	0.91	0.084	0.394	

Table 17 shows the results for the tests of discriminant validity from the Partial Least Squares regression with the Fornell-Larcker criterion. The table presents two panels. Panel A shows results for the original model with all indicators for all latent variables. Panel B shows the results for the final model after the deletion of indicators in the iterative, depurative process in the measurement model validation. These panels are divided into six columns: Column 1 shows the latent variables representing the dimensions of earnings quality: accruals quality (*ACCRUALS_QUALITY*), conservatism (*CONSERVATISM*), perceived quality by equity investors (*PERCEIVED_EQ*), persistence (*PERSISTENCE*), and earnings smoothing (*SMOOTH*); Columns 2 to 6 present the latent variables for which we assess discriminant validity with respect to column 1. The values that are shown in the table represent the Heterotrait-Monotrait ratio for all pairs of latent variables that are analysed. All variables are defined in Appendix C.

After the iterative process in which we have depurated the model we can observe how the results still yield inacceptable values for HTMT with conservatism, although in this case only with respect to earnings smoothing. A possible cause for this can be the fact that, in our final model, conservatism is represented by a single indicator. Then, we cannot properly conclude that conservatism is distinct from the rest of variables but, at best, that the indicator measuring the extent of skewness in the distribution of earnings (*CONS3_Skew*) is distinct from the rest of earnings quality dimensions, with the exception of earnings smoothing. The reason of such similarity of earnings smoothing and the skewness of earnings could be that accrual accounting it is actually smoothing out the skewness in operating cash flows; thus, absent conservatism it should be expected a lower skewness of earnings than the skewness in cash flows (Ryan, 2006). Therefore, the extent of skewness of earnings comes in fact from the normal smoothing of earnings due to the accrual accounting practice.

In conclusion, results for discriminant validity indicate that the dimensions of earnings quality are actually different from each other, for they are representing different things. The only exception is conservatism, which is not able to explain a single theoretical concept that is different from the rest of the earnings quality dimensions.

In an attempt to solve the problem with *CONSERVATISM*, we have tried to include its single indicator, *CONS3_Skew* in the construct of earnings smoothing, to check whether results would improve. However, results for both indicator reliability, construct reliability and validity (untabulated) showed inacceptable levels. Then, we decide to maintain the model with *CONS3_Skew* as the single indicator representing *CONSERVATISM*.

4.5-) RESULTS FOR STRUCTURAL MODEL VALUATION.

Once we have assessed the validity of the measurement model, we present results for the valuation of the structural model. This assessment will indicate whether the properties of earnings quality are actually explaining the expected outcomes for earnings quality in terms of investor responsiveness to accounting information. To do so, we analyse the in-sample and out-of-sample power of the model. PLS offers the tests of R^2 and Q^2. R^2 analyses the in-sample predictive power of the model whereas Q^2 indicates the out-of-sample predictive power. Results for these tests are shown in Table 18.

TABLE 18: STRUCTURAL MODEL VALIDATION. R-SQUARE AND Q-SQUARE.

	Adjusted R^2	*Q^2*
Complete	0.041	0.029
ACCRUALS_QUALITY	0.002	0.001
CONSERVATISM	0.011	0.008
PERSISTENCE	0.029	0.020
SMOOTH	0.010	0.008

Table 18 shows the results for the tests of structural model valuation using R^2 and Q^2 criteria from the Partial Least Squares regression. Exogenous latent variables are accounting properties of earnings determining earnings quality from the final model after depurating these variables according to measurement validation results (*ACCRUALS_QUALITY*, *CONSERVATISM*, *PERSISTENCE* and *SMOOTH*). Endogenous variable is the perceived extent of earnings quality by equity investors (*PERCEIVED_EQ*). Columns show results for three different values from structural model valuation tests: Column 1 represents adjusted R^2, and Column 2 indicates Q^2. Rows indicate the different models. Row 1 represents the complete depurated model. Rows 2 to 5 represent models in which we take as the exogenous variable every single properties of accounting information defining earnings quality. All latent variables are defined in Appendix C.

In Table 18 we can observe how the consideration of a single dimension of earnings quality in the model have an in-sample power of around 0.2% – 1% as indicated by adjusted R^2 , with the only exception of *PERSISTENCE* that shows a higher estimation power (2.90%). For the model with all latent variables, the estimation power is 4.10%. Henceforth, the reported values for the estimation power are not very high. Considering that the exogenous variables are determinants of earnings quality and the endogenous one is the response of earnings quality information perceived by their users (equity investors), a future debate is needed regarding whether the consideration of the outcomes of earnings quality is actually reflecting an appropriate empirical representation of earnings quality concept.

The out-of-sample estimation power in earnings quality measurement can be observed by analysing the values for Q^2. This value, calculated as 1 minus the sum of the squared errors divided into the sum of squared residuals is considering the estimation error in the regression. If we look at this value, the closer this value to 1, the lower the error generated in the estimation. In Table 18, it is noteworthy how properties have low values for Q^2 (in a range of 0.001 to 0.008) with the exception of *PERSISTENCE*, which exhibits considerable higher out-of-sample predictive power in comparison with the rest of properties. When we include all of the properties Q^2 is 0.029, which keeps been a low value.

In conclusion, taken together the results for R^2 and Q^2, we can conclude that both in-sample and out-of-sample power when analysing how determinants of *EQ* explain *PERCEIVED_EQ* is low, even if we include all of the properties that define *EQ*. However, despite his low predictive power, there is a property that shows a considerably better power to explain perceptions of the extent of earnings quality by equity investors, which is *PERSISTENCE*. This result is in line with prior literature studies that have asked the users of financial information, obtaining empirical evidence of a perception of the persistence of earnings as the most relevant property of accounting information (Tucker & Zarowin, 2006). Notwithstanding its higher predictive value, it is surprising how persistence is not considered usually as a representative property for earnings quality, in contrast with other properties more widely adopted in prior literature as the appropriate representation of earnings quality such as accruals quality or conservatism, as it was analysed in Chapter 2.

4.6-) ASSESSMENT OF THE VALIDITY OF THE SECOND-ORDER CONSTRUCT EARNINGS QUALITY.

The analysis of the validity of higher-order constructs responds to the question of whether it makes sense considering a more general, abstract, theoretical concept at a higher level of abstraction. In our case, if the validity of the second-order construct, Earnings Quality (*EQ*) is assessed it implies that there is actually a general concept of earnings quality that is more explicative (adds more information) than merely a list of its dimensions.

As a previous step for higher-order validity assessment, the validity of first-order constructs must have been assessed (Gefen et al., 2011, 2000; Mackenzie et al., 2011; Wright, Campbell, Thatcher, & Roberts, 2012), as we did in subsections 4.3 to 4.5. Having met acceptable values for the rules of thumb in each of the analysed tests for first-order constructs, the final step is to assess the validity of the second-order latent variable (Wright et al., 2012) (in our case, earnings quality).

To assess the validity of the higher-order constructs, the same standards than for the first-order ones should be followed. However, instead of analysing the relationships of the variable with the indicators (as in the first-order analysis), one should consider the weights or loadings from the relationships of the higher-order constructs with the first-order constructs (Becker et al., 2012). Because such relationship for our exogenous second-order variable, *EQ*, with the first-order variables that define it (*ACCRUALS_QUALITY*, *CONSERVATISM, PERSISTENCE* and *SMOOTHING*) is formative, we follow the steps for formative validity assessment. Results from the validity assessment regarding the relationships of the second-order construct with the first-order ones can be observed in Tables 19 (redundancy analysis test), 20 (analysis of VIF values) and 21 (bootstrapping test).

The first test is a redundancy analysis (Panel A) in which it is tested whether the first-order constructs (in our model, earnings properties) have a higher predictive value when analysing them with other constructs different than the endogenous variable. More in detail, the formatively measured construct should predict an endogenous one operationalized with one or more of its indicators as a reflective construct (Chin, 1998;

Hair, Tomas, et al., 2016). To test such redundancy analysis we form a reflective construct of earnings quality, *EQ_refl*, with two indicators from each of the earnings properties that are representative of earnings quality. These indicators, which have been randomly selected, are the following: *PERS2_earn_R2*, *PERS4_disagg_R2*, *CONS_MTB*, *CONS3_Skew*, *AQ4_Dechow_95*, *AQ10_Larcker*, *SMOOTH1_dev_earn_cfo*, *SMOOTH2_corr_accr_cfo*. Values for R^2 above 0.8 are indicative of acceptable levels (Chin, 2010; Hair, Tomas, et al., 2016). Results are presented in Table 20.

TABLE 19: VALIDATION OF THE SECOND-ORDER CONSTRUCT (EARNINGS QUALITY). RESULTS FROM THE REDUNDANCY ANALYSIS TEST.

	Path coefficient	R Square Adjusted
EQ_refl	0.953	0.907

Table 19 shows the results for the redundancy analysis test for the validation of the second-order construct in the Partial Least Squares hierarchical model: Earnings Quality (*EQ*). In details, this table presents the results for redundancy analysis of *EQ* as formative second-order construct with a reflective one (*EQ_refl*) that is formed by several indicators of the first-order construct, that is, the properties defining earnings quality. These indicators, which have been randomly selected (two indicators from each dimension) are the following: *PERS2_earn_R2*, *PERS4_disagg_R2*, *AQ4_Dechow_95*, *AQ10_Larcker*, *SMOOTH1_dev_earn_cfo*, *SMOOTH2_corr_accr_cfo*, *CONS5_MTB* and *CONS3_Skew*. Panel B shows results for the outer VIF values of the first-order constructs (earnings properties) that are taken as formative indicators to define the second-order construct (*EQ*). Panel C shows results of the bootstrapping test for the outer weights of the first-order constructs (earnings properties) that are taken as formative indicators to define the second-order construct (*EQ*). All indicator variables are defined in Appendix C.

Looking at Table 19, results show that the path linking the formative second-order measure of earnings quality with the reflective measure formed with aforementioned indicators has a magnitude of 0.953 with R^2 of 0.907. Consequently, the formative construct reflects an acceptable extent of convergent validity.

The second step is to check that indicators defining a formatively-measured construct lack of multicollinearity problems. To do so, VIF values can be analysed (Panel B). As a rule of thumb, values above 0.5 represent multicollinearity problems (Hair et al., 2011, 2016; Henseler et al., 2012). The values of VIF for the earnings properties representing earnings quality are presented in Table 20.

TABLE 20: VALIDATION OF THE SECOND-ORDER CONSTRUCT (EARNINGS QUALITY). OUTER VIF VALUES.

	VIF
ACCRUALS_QUALITY	1.004
CONSERVATISM	1.041
PERSISTENCE	1.029
SMOOTH	1.047

Table 20 shows the results for the analysis of VIF values for the validation of the second-order construct in the Partial Least Squares hierarchical model: Earnings Quality (*EQ*). In details, this table presents the results for the outer VIF values of the first-order constructs (earnings properties: *ACCRUALS_QUALITY*, *CONSERVATISM*, *PERSISTENCE* and *SMOOTH*) that are taken as formative indicators to define the second-order construct (*EQ*). All variables are defined in Appendix C.

If we look at Table 20, we can observe how outer VIF values for all of earnings properties are around 0.1. Then, we can conclude that there are none multicollinearity problems when aggregately defining earnings quality as a formative construct.

Finally, the last step is to check the relevance (statistical significance) of the formative indicators. To do so, we analyse the results from the bootstrapping test, analysing whether the coefficient of these formative indicators is statistically significantly different from zero at a certain error probability in an approximated distribution that is formed from repeated 5.000 random sampling with replacement from the original model (Hair et al., 2011, 2012, 2016; Roldán & Sánchez-Franco, 2012). In this test we must assess two things (Edwards, 2001; Hair et al., 2016; Henseler et al., 2012): 1) All of the first-order variables (in our case, the earnings properties defining earnings quality) are statistically significant to explain the second-order variable (in our case, earnings quality). 2) The sign of the coefficients of the first-order variables that are used as indicators to explain the second-order variable is the same than the sign these variables had in the analysis of the structural model valuation. Table 21 shows results for the bootstrapping test.

TABLE 21: VALIDATION OF THE SECOND-ORDER CONSTRUCT (EARNINGS QUALITY). RESULTS FROM THE BOOTSTRAPPING TEST.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
ACCRUALS_QUALITY -> EQ	0.173	0.173	0.031	5.647	0.000
CONSERVATISM -> EQ	0.375	0.371	0.037	10.098	0.000
PERSISTENCE -> EQ	0.734	0.735	0.029	25.672	0.000
SMOOTH -> EQ	-0.330	-0.328	0.035	9.336	0.000

Table 21 shows the results for the analysis of the statistical significance of the first-order latent variables for the validation of the second-order construct in the Partial Least Squares hierarchical model: Earnings Quality (*EQ*). In details, this table presents the results for the bootstrapping test of the outer weights of the first-order constructs (earnings properties: *ACCRUALS_QUALITY*, *CONSERVATISM*, *PERSISTENCE* and *SMOOTH*) that are taken as formative indicators to define the second-order construct (*EQ*). All variables are defined in Appendix C.

Additionally, for a more clear understanding of the results we have graphically represented for the structural model of the second-order construct in Figure 7

FIGURE 7: RESULTS FOR THE STRUCTURAL MODEL OF THE SECOND-ORDER CONSTRUCT.

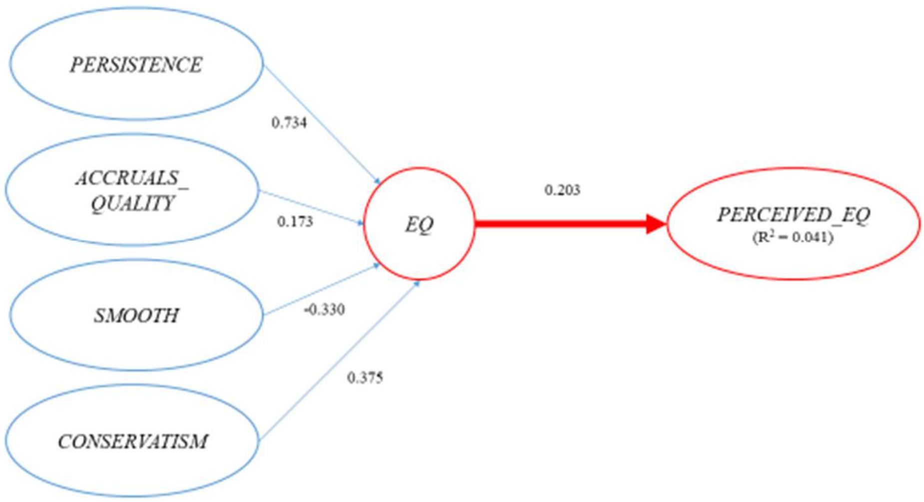


Figure 7 graphically represents the results for the structural model of the regression of the second-order construct in the Partial Least Squares hierarchical model, Earnings Quality (*EQ*), on the dependent variable, the perceived level of earnings quality by equity investors (*PERCEIVED_EQ*). In details, this table presents the path coefficients of the first-order constructs (earnings properties: *PERSISTENCE, ACCRUALS_QUALITY*, *SMOOTH* and *CONSERVATISM*) that are taken as formative indicators to define the second-order construct (*EQ*). The figure presents as well the coefficient of *EQ* on *PERCEIVED_EQ*. The R^2 of the model is represented between brackets in the latent variable *PERCEIVED_EQ*. All variables are defined in Appendix C.

We can check in Table 21 that all of the properties are statistically significant to explain earnings quality. Moreover, there are no changes in the sign of the relationship with earnings quality with respect to the sign of the coefficient in the structural model valuation (untablated). Notwithstanding, two facts are surprising. First of all, the coefficient for earnings smoothing (*SMOOTH*) is negative and statistically significant, indicating that higher extent of earnings smoothing is perceived as worse quality information by equity investors. Secondly, it is noteworthy how despite accruals quality is the most commonly analysed of earnings properties (as analysed in Chapter 2), its coefficient is smaller than the rest of properties of accounting information (thereby explaining a lower proportion of the perceived level of earnings quality by equity investors), which have been less adopted in earnings quality models such as smoothing or persistence.

All these things considered we conclude that earnings quality as a higher-order construct formatively defined by earnings quality properties meets all validation criteria suggested in prior literature, thereby proving the existence of a general, more abstract theoretical concept of earnings quality that is defined by several earnings properties. Moreover, for each of these properties, a validation of the proxies used in prior literature to measure them can be assessed, thereby selecting the only properties that correctly represent from an empirical point of view the theoretical facet of earnings quality they aim to measure.

In next section, as additional analysis we include a useful test in PLS estimation technique: the importance-performance analysis. With this test we can observe the opportunities of improvement in the measurement of the latent variables that contribute to explain the target construct in a high extent but present, though, poor measurement by its indicators.

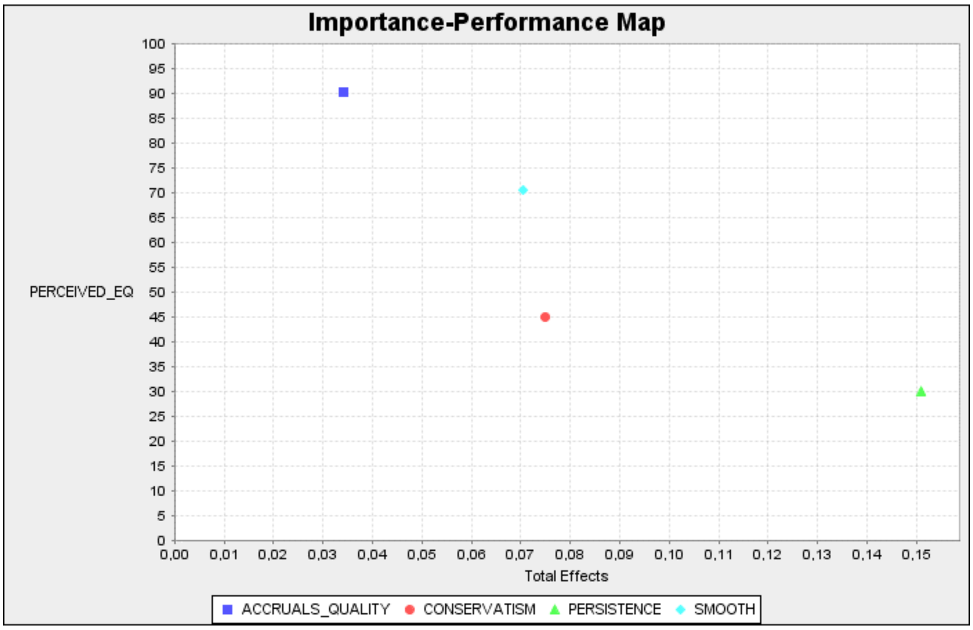
4.7 ADDITIONAL ANALYSIS. THE IMPORTANCE-PERFORMANCE MAP ANALYSIS (IPMA). WHERE COULD RESEARCH ON EARNINGS QUALITY BE FOCUSED ON?

The Importance-Performance Map Analysis (hereafter, IPMA) provides a more in-depth understanding about which of the properties of earnings quality is contributing to its measurement in a higher extent. This tool identifies the extent of relevance of a sort variables to predict a target construct (in this case, properties defining earnings quality) (Hair et al., 2017; Ringle & Sarstedt, 2016). Similarly, it can be run at the indicator level, concluding which of the indicators are contributing on a higher extent to define the latent variable they are linked to (Hair et al., 2017). This technique compares the influence of the latent variables (in our case, earnings properties defining earnings quality) to explain the variance of the dependent variable (in our case, the perceived level of earnings quality by equity investors), that is, the importance, with the appropriateness of measurement of these latent variables, that is, performance. Results are represented graphically with importance on the x-axis and performance in the y-axis. This is especially useful when endogenous target variable has reflective measurement model and exogenous constructs have formative measurement models because performance improvements of indicators in measurement models increase the performance of exogenous construct, enhancing prediction (Höck, Sarstedt, & Ringle, 2010). This is the case of our model of earnings quality, which has been defined as a Type-II hierarchical aggregated variable.

We run the analysis for the depurated model taking value relevance as the dependent variable and show the IPMA picture both at the construct level and at the indicator level. We present the results in Figure 8, where Panel A reflects the IPMA graphical representation at the latent variable level and Panel B at the indicator level.

FIGURE 8: IMPORTANCE-PERFORMANCE MAP ANALYSIS. GRAPHIC MAP.

PANEL A: LATENT VARIABLES IPMA.



PANEL B: INDICATOR VARIABLES IPMA.

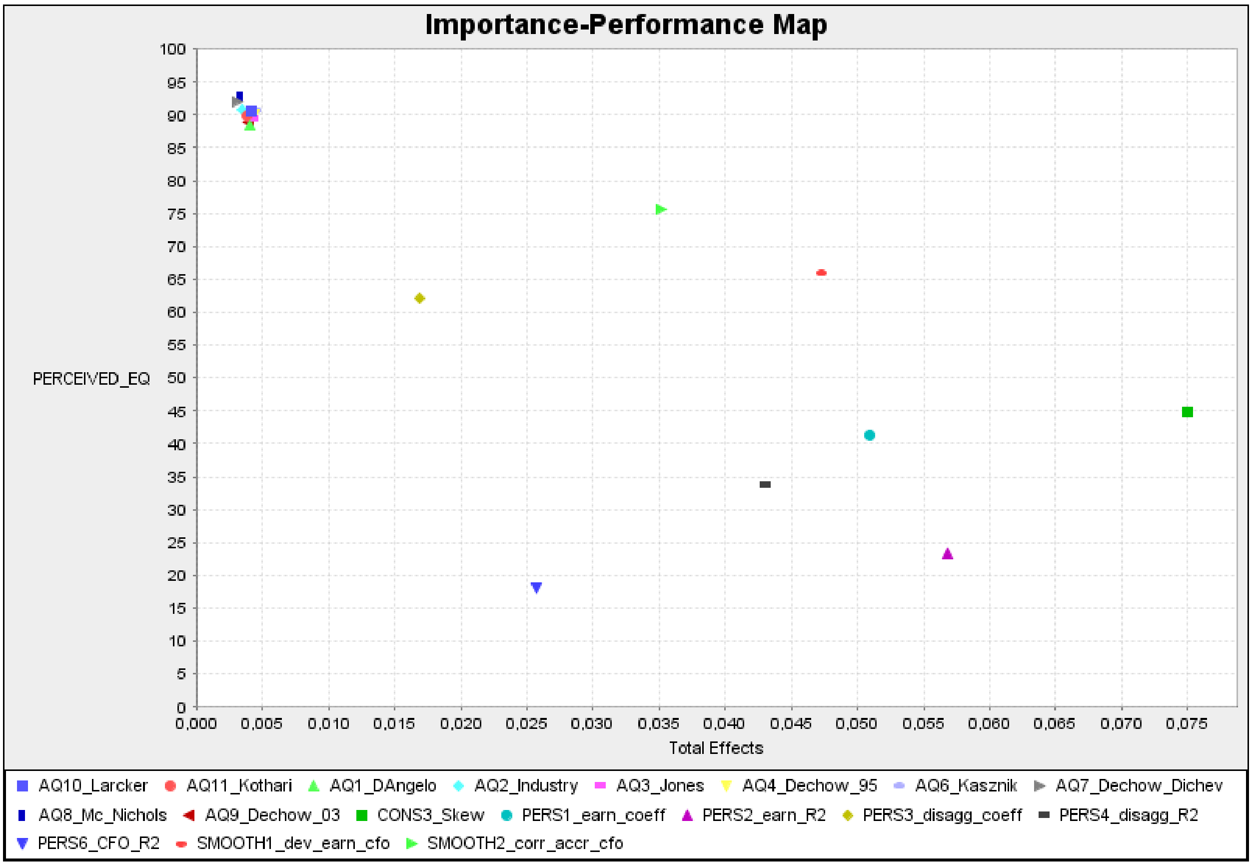


Figure 8 shows the graphical map for the Importance-Performance Map Analysis (IPMA) from the Partial Least Squares regression of the properties determining earnings quality (EQ) as exogenous variables (*ACCRUALS_QUALITY*, *CONSERVATISM*, *PERSISTENCE* and *SMOOTH*) on the endogenous variable of earnings quality that is perceived by equity investors (*PERCEIVED_EQ*). The figure is divided into two panels. Panel A shows the graphic for the latent variables level and Panel B shows the graphic for the indicator variables level. These graphics correspond to the standardized values from the IPMA test. All variables are defined in Appendix C.

We also present the results of this analysis in Table 22 to facilitate the assessment of the importance and total effects of latent variables (Panel A) and indicators (Panel B).

TABLE 22: IMPORTARNCE-PERFORMANCE MAP ANALYSIS (IPMA).

PANEL A: LATENT VARIABLES IPMA.

	Importance	Performance
PERSISTENCE	0.151	30.070
ACCRUALS_QUALITY	0.034	90.383
SMOOTH	0.070	70.631
CONSERVATISM	0.075	44.960
Mean:	0.083	59.011

PANEL B: INDICATOR VARIABLES IPMA.

	Importance	Performance
PERS1_earn_coeff	0.051	41.327
PERS2_earn_R2	0.057	23.190
PERS3_disagg_coeff	0.017	62.043
PERS4_disagg_R2	0.043	33.776
PERS6_CFO_R2	0.026	18.022
AQ10_Larcker	0.004	90.446
AQ11_Kothari	0.004	89.874
AQ1_DAngelo	0.004	88.414
AQ2_Industry	0.003	90.780
AQ3_Jones	0.004	89.468
AQ4_Dechow_95	0.004	90.022
AQ6_Kasznik	0.005	90.707
AQ7_Dechow_Dichev	0.003	92.070
AQ8_Mc_Nichols	0.003	92.803
AQ9_Dechow_03	0.004	88.993
SMOOTH1_dev_earn_cfo	0.047	65.983
SMOOTH2_corr_accr_cfo	0.035	75.709
CONS3_Skew	0.075	44.960
Mean:	0.022	70.477

Table 22 shows the results for the Importance-Performance Map Analysis (IPMA) from the Partial Least Squares regression of the properties determining earnings quality (*EQ*) as exogenous variables (*ACCRUALS_QUALITY*, *CONSERVATISM*, *PERSISTENCE* and *SMOOTH*) on the endogenous variable of earnings quality that is perceived by equity investors (*PERCEIVED_EQ*).. The table is divided into two panels. Panel A shows the results for the latent variables level and Panel B shows the results for the indicator variables level. For both panels, Column 1 exhibits the values for importance and Column 2 exhibits the values for performance of the variables object of analysis to explain the endogenous variable. These results correspond to the standardized values from the IPMA test. All variables are defined in Appendix C.

The lower right area is indicative of constructs that have greater opportunities to improve because their importance for the definition of the target construct is above the average, but their performance is below the average. In other words, these are construct that have a great influence in the explanation of the behaviour of the dependent variable but that are not appropriately measured. The following areas with more possibility of improvement are the upper right, lower left, and in a lower extent, upper left area.

At the construct level, Panel A of Figure 8 shows that *PERSISTENCE* (located in the lower right area) is a property that has opportunities to improve. More in details, in Table 22 we can observe that *PERSISTENCE* is the most important property to explain the *PERCEIVED_EQ*, as shown by its importance value (0.151) clearly about the mean value of all the properties (0.083). However, performance values for the appropriateness of measurement exhibit the lowest value (30.070). In the opposite situation (located in the upper left area in Figure 8, Panel A), IPMA results show that the importance of *ACCRUALS_QUALITY* to explain *PERCEIVED_EQ* does not meet the mean importance value (0.034 versus 0.083), despite its performance value (90.383) clearly exceeds the mean value (59.011), thereby proving that it is correctly measured. This result, then, indicates that the quality of accruals is not a key property of earnings for equity investors. This low importance of *ACCRUALS_QUALITY*, together with the greater importance of *PERFORMANCE* is consistent with previous papers that have interviewed analysts or managers about the main features of earnings quality (Brown et al., 2015; Tucker & Zarowin, 2006), and contrasts with the large number of earnings quality studies that are mainly based on accruals quality (as indicated in Chapter 2). Henceforth, it should be taken as an impulse for improving the measurement of *PERSISTENCE* and considering this property more times in earnings quality models as opposed to current situation, in which is the property less analysed, as shown in Chapter

2. With respect of the other two properties, *SMOOTH* is the third property in importance to explain *PERCEIVED_EQ* (importance value = 0.083) despite the fact that it is the second property regarding the appropriateness of measurement (performance value = 70.631, clearly above the mean performance value of 59.011). Finally, *CONSERVATISM* has also opportunities to improve. More in details in Table 22 it is noteworthy how, despite conservatism is the second property in importance to explain *PERCEIVED_EQ* (importance value = 0.075), it is not appropriately measured, as reflected by a low performance value (44.960), which is below the average (59.011).

Summing up IPMA analysis at the latent variable level, more improvements could be done in the measurement of persistence and conservatism in future research. The reason is that these properties are important to explain the perceived level of earnings quality by equity investors but show poorer performance than other properties with a lesser importance.

At the indicator level, according to the results shown in Panel B of Table 22, *PERSISTENCE* and *SMOOTH* indicators, as well as the single indicator for *CONSERVATISM*, *CONS3_Skew* are important to explain *PERCEIVED_EQ*, as shown by importance values for all of these indicators (with the only exception of *PERS3_disagg_coeff*) that are equal or above the average value (0.022). Notwithstanding this, performance of the five *PERSISTENCE* measures (*PERS1_earn_coeff* (performance = 41.327), *PERS2_earn_R2* (performance = 23.19), *PERS3_disagg_coeff* (performance = 62.043), *PERS4_disagg_R2* (performance = 33.776) and *PERS6_CFO_R2* (performance = 18.022)) as well as *CONS3_Skew* (performance = 44.960) show values that are below the average performance value (70.477). For that reason, an attempt to improve measurement of these conservatism and persistence models in future research is required, for these proxies contribute to explain earnings quality outcomes in a greater extent but their performance is below the mean value. In the opposite situation, all indicators measuring *ACCRUALS_QUALITY* show importance values below (and far from) the mean value despite yielding performance values clearly above the mean value. This reinforces the aforementioned concern about the low accruals quality contribution to explain perceived earnings quality by equity investors, in spite of the fact that this property is appropriately measured by its indicators.

4.8 CONCLUSIONS FOR CHAPTER 4.

One of the problems in earnings quality measurement highlighted in prior literature is that proxies have statistical estimation problems (Leuz & Wysocki, 2016) and capture different aspects of earnings quality, making it difficult to clarify whether they represent different aspects of the same concept or even different concepts (Ewert & Wagenhofer, 2011). Besides, weak or negative correlation between proxies measuring the same concept have been observed. In this regard, PLS responds to the concern of whether each proxy is appropriately measuring the theoretical aspect that they proxy for. Results show, in broad terms acceptable values for validity in accruals quality, smoothing and persistence. However, proxies for conservatism do not represent a common theoretical. Moreover, the final representation of conservatism in our model resulted not distinguishable from other dimensions of earnings quality.

Apart from validity assessment for measurement model, that is, how theoretical concepts are empirically represented by the proxies, PLS also analyses the predictive power of the model. We consider how earnings properties determining earnings quality are able to predict the perceived extent of earnings quality by equity investors. Our results evidence that, in general, properties of earnings quality explain a small proportion of the perceived level of earnings quality that is perceived by equity investors. However, among all of the properties, persistence of earnings shows a considerably explanatory power in comparison with them, both in terms of in-sample (adjusted R^2) and out-of-sample (Q^2) predictive power. Given the lesser consideration in prior literature of this property as representative of earnings quality as compared with other properties such as accruals quality or conservatism, our study offers new insights for earnings quality measurement in future research. Considering the higher predictive power and the appropriate validity measurement of persistence, we suggest that this property is considered more frequently in earnings quality studies. On the other hand, despite accruals quality results show that this is the property is best measured by its indicators, it is the property that is less important to explain the perceived level of earnings quality by equity investors. Henceforth, we consider that future studies of earnings quality keep on considering accruals quality, but correcting the weight that this property has to explain the outcomes of earnings quality

Finally, our results also prove the validity of a general, more abstract concept of earnings quality that is explained by earnings properties of accounting information, and not merely the existence of these properties isolatedly.

4.9. REFERENCES FOR CHAPTER 4.

Artiach, T. C., & Clarkson, P. M. (2011). Disclosure, conservatism and the cost of equity capital: A review of the foundation literature. *Accounting and Finance*, *51*(1), 2–49.

Ball, R., Kothari, S. P., & Ashok, R. (2000). The effect of international institutional factors on properties of accounting earnings. *Journal of Accounting & Economics*, *29*(1), 1–51.

Ball, R., & Shivakumar, L. (2005). Earnings quality in UK private firms: comparative loss recognition timeliness. *Journal of Accounting & Economics*, *39*(1), 83–128.

Ball, R., & Shivakumar, L. (2006). The Role of Accruals in Asymmetrically Timely Gain and Loss Recognition. *Journal of Accounting Research*, *44*(2), 207–242.

Basu, S. (1997). The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting & Economics*, *24*(1), 3–37.

Beaver, W. H., & Ryan, S. G. (2000). Biases and lags in book value and their effects on the ability of the book-to-market ratio to predict book return on equity. *Journal of Accounting Research*, *38*(1), 127–148.

Beaver, W. H., & Ryan, S. G. (2005). Conditional and Unconditional Conservatism:Concepts and Modeling. *Review of Accounting Studies*, *10*(2–3), 267–269.

Becker, J. M., Klein, K., & Wetzels, M. (2012). Hierarchical Latent Variable Models in PLS-SEM: Guidelines for Using Reflective-Formative Type Models. *Long Range Planning*, *45*(5–6), 359–394.

Brown, L. D., Call, A. C., Clement, M. B., & Sharp, N. Y. (2015). Inside the 'Black Box' of sell-side financial analysts. *Journal of Accounting Research*, *53*(1), 1–47.

Cano-Rodríguez, M., & Nunez-Nickel, M. (2015). Aggregation bias in estimates of conditional conservatism: Theory and evidence. *Journal of Business Finance and Accounting*, *42*(1–2), 51–78.

Carmines, E. G., & Zeller, R. A. (1979). *Reliability and validity assessment. SAGE University Papers on Quantitative Applications in the Social Sciences 07-17*. Beverly Hills, CA: SAGE.

Chin, W. (1998). The partial least squares approach for estructural equation modeling. . *Modern Methods for Business Researchs*, *Mahwah (NJ*, 295–336.

Chin, W. W. (2010). How to write up and report PLS analyses. In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of Partial Least Squares: Concepts, methods and applications* (pp. 655–690). Berlin, Germany: Springer-Verlag.

DeAngelo, L. E. (1986). Accounting Numbers as Market Valuation Substitutes: A Study of Management Buyouts of Public Stockholders. *The Accounting Review*, *61*(3), 400–420.

Dechow, P., & Dichev, I. (2002). The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, *77*(Supplement), 35–59.

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting & Economics*, *50*(2/3), 344–401.

Dechow, P., Richardson, S., & Tuna, I. (2003). Why Are Earnings Kinky? An Examination of the Earnings Management Explanation. *Review of Accounting Studies*, *8*(2–3), 355–384.

Dechow, P., & Sloan, R. G. (1991). Executive Incentives and the Horizon Problem: An Empirical Investigation. *Journal of Accounting & Economics*, *14*(1), 51–89.

Dechow, P., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review*, *70*(2), 193–225.

Diamantopoulos, A., & Winklhofer, H. M. (2001). Index Construction with Formative Indicators: An Alternative to Scale Development. *Journal of Marketing Research*, *38*(2), 269–277.

Dijkstra, T. K., & Henseler, J. (2015). Consistent and asymptotically normal PLS estimators for linear structural equations. *Computational Statistics and Data Analysis*, *81*, 10–23.

Edwards, J. R. (2001). Multidimensional constructs in organizational behavior research: An integrative analytical framework. *Organizational Research Methods*, *4*(2), 144–192.

Ewert, R., & Wagenhofer, A. (2011). *Earnings quality metrics and what they measure* (Working Paper). University of Graz.

Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2004). Costs of Equity and Earnings Attributes. *The Accounting Review*, *79*(4), 967–1010.

Gefen, D., Rigdon, E. E., & Straub, D. W. (2011). An Update and Extension to SEM Guidelines for Administrative and Social Science Research. *MIS Quarterly*, *35*(2), iii-A7.

Gefen, D., Straub, D. W., & Boudreau, M.-C. (2000). Structural Equation Modeling and Regression: Guidelines for Research Practice. *Communications of the Association for Information Systems*, *4*(1), 7.

Giner, B., & Rees, W. (2001). On the asymmetric recognition of good and bad news in France, Germany and the United Kingdom. *Journal of Business Finance & Accounting*, *28*(9–10), 1285–1331.

Givoly, D., & Hayn, C. (2000). The changing time-series properties of earnings, cash flows and accruals: Has financial reporting become more conservative? *Journal of Accounting & Economics*, *29*(3), 287–320.

Givoly, D., Hayn, C., & Natarajan, A. (2007). Measuring reporting conservatism. *The Accounting Review*, *82*(1), 65–106.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *The Journal of Marketing Theory and Practice*, *19*(2), 139–152.

Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012). The Use of Partial Least Squares Structural Equation Modeling in Strategic Management Research: A Review of Past Practices and Recommendations for Future Applications. *Long Range Planning*, *45*(5–6), 320–340.

Hair, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced Issues in Partial Least Squares Structural Equation Modeling* (2nd ed.). Thousand Oaks, CA, CA: Sage.

Hair, J. F., Tomas, G., Hult, M., Ringle, C. M., & Sarstedt, M. (2016). *A primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (2nd ed.). Thousand Oaks, CA: Sage.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2012). Using partial least squares path modeling in advertising research: basic concepts and recent issues. In S. Okazaki (Ed.), *Handbook of Research on International Advertising* (pp. 252–276). Cheltenham, UK: Edward Elgar.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares structural equation modeling in marketing research. *Advances in International Marketing*, *20*, 277–320.

Höck, C., Sarstedt, M., & Ringle, C. M. (2010). Management of multi-purpose stadiums: importance and performance measurement of service interfaces. *International Journal of Services Technology and Management*, *14*(2/3), 188–207.

Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research*, *30*(2), 199–218.

Jones, J. J. (1991). Earnings Management During Import Relief Investigations. *Journal of Accounting Research*, *29*(2), 193–228.

Kang, S.-H., & Sivaramakrishnan, K. (1995). Issues in testing earnings management and an instrumental variable approach. *Journal of Accounting Research*, *33*(2), 353–367.

Kasznik, R. (1999). On the association between voluntary disclosure and earnings management. *Journal of Accounting Research*, *37*(1), 57–80.

Khan, M., & Watts, R. L. (2009). Estimation and empirical properties of a firm-year-measure of accounting conservatism. *Journal of Accounting & Economics*, *48*, 132–150.

Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting & Economics*, *39*(1), 163–197.

Larcker, D. F., & Richardson, S. (2004). Fees Paid to Audit Firms, Accrual Choices, and Corporate Governance. *Journal of Accounting Research*, *42*(3), 625–658.

Leuz, C., & Wysocki, P. D. (2016). The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research. *Journal of Accounting Research*, *54*(2), 525–622.

Li, Y., Niu, J., Zhang, R., & Largay, J. A. (2011). Earnings Management and the Accrual Anomaly: Evidence from China. *Journal of International Financial Management & Accounting*, *22*(3), 205–245.

Mackenzie, S. B., Podsakoff, P. M., & Podakoff, N. P. (2011). Construct measurement and validation procedures in mis and behavioral research: integrating new and existing techniques. *MIS Quarterly*, *35*(2), 293–334.

McNichols, M. F. (2002). Discussion of The Quality of Accruals and Earnings: The Role of Accruals Estimation Errors. *The Accounting Review*, *77*(Supplement), 61–69.

Reinartz, W., Haenlein, M., & Henseler, J. (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of Research in Marketing*, *26*(4), 332–344.

Richardson, S., Sloan, R. G., Soliman, M. T., & Tuna, I. (2005). Accrual reliability, earnings persistence and stock prices. *Journal of Accounting and Economics*, *39*, 437–485.

Ringle, C. M., & Sarstedt, M. (2016). Gain more insight from your PLS-SEM results. *Industrial Management & Data Systems*, *116*(9), 1865–1886.

Ringle, C. M., Sarstedt, M., & Straub, D. W. (2012). A critical look at the use of PLS-SEM in MIS Quarterly. *MIS Quarterly*, *36*(1), 3–14.

Roldán, J. L., & Sánchez-Franco, M. J. (2012). Variance-based structural equation modeling: Guideliness for using partial least squares in information systems research. In M. Mora, O. Gelman, A. Steenkamp, & M. S. Raisinghani (Eds.), *Research Methodologies, Innovations and Philosophies in Software Systems Engineering and Information Systems* (pp. 193–211). Hershey, PA: IGI Global.

Roychowdhury, S., & Watts, R. L. (2007). Asymmetric timeliness of earnings, market-to-book and conservatism in financial reporting. *Journal of Accounting & Economics*, *44*(1/2), 2–31.

Ryan, S. G. (2006). Identifying conditional conservatism. *European Accounting Review*, *15*(4), 511–525.

Tucker, J. W., & Zarowin, P. (2006). Does Income Smoothing Improve Earnings Informativeness? *The Accounting Review*, *81*(1), 251–270.

Wang, R. Z., Hogartaigh, C. O., & Van Ziji, T. (2009). Measures of Accounting Conservatism: A construct validity perspective. *Journal of Accounting Literature*, *28*, 165–203.

Wetzels, M., & Odkerken-Schröder, G. (2009). Using PLS Path Modeling for Assessing Hierarchical Construct Models: Guidelines and Empirical Illustration. *MIS Quarterly*, *33*(1), 177–195.

Wright, R. T., Campbell, D. E., Thatcher, J. B., & Roberts, N. (2012). Operationalizing Multidimensional Constructs in Structural Equation Modeling : Recommendations for IS Research Operationalizing Multidimensional Constructs in Structural Equation Modeling : Recommendations for IS Research. *Comunications of the Association for Information System*, *30*, 367–412.

APPENDIX C: ESTIMATION MODELS

In this Appendix we present the detailed description for the process of calculation of the proxies (empirical indicators) that are more commonly used in earnings quality literature to measure the different non-directly observable dimensions of earnings quality (latent variable, construct). The indicators are sorted according to the latent variable to which they are related. All estimated indicators will be winsorized at 1%.

CONSTRUCT 1: PERCEIVED EARNINGS QUALITY BY EQUITY INVESTORS (*PERCEIVED_EQ*).

All of the following indicators are calculated for each firm following a longitudinal approach, using a 5-year rolling window:

1-) ***ERC1_coeff*** and ***ERC2_R2:*** Coefficient (β_1) and adjusted R^2 (respectively) from the ERC (Earnings Response Coefficient) model:

$$Returns_t = \beta_0 + \beta_1\ Earnings_t + \beta_2\ \Delta Earnings_t + \varepsilon_t.$$

2-) ***V_RELEV1_Book_v_coeff, V_RELEV2_Earn_coeff*** and ***V_RELEV3_R2:*** Coefficients (β_1 and β_2) and adjusted R^2 (respectively) from the Value relevance of earnings model (proportion of price explained by earnings):

$$Price_t = \beta_0 + \beta_1\ Book\ Value\ per\ Share_t + \beta_2\ EPS_t + \varepsilon_t.$$

For all of aforementioned equations, variables are defined as follows:

R_t = Returns from CRSP (Ret).

$Earnings_t$ = Earnings Before Extraordinary Items (#18).

$\Delta Earnings_t$ = Change in Earnings Before Extraordinary Items (#18) from the previous year to the current year.

$Price_t$ = Price from CRSP (Prc).

Book Value per Share$_t$ = Book Value Per Share from CRSP (Bkvlps).

EPS_t = Earnings Per Share (Basic) including Extraordinary Items (#53).

CONSTRUCT 2: PERSISTENCE (*PERSISTENCE*).

All of the following indicators are calculated for each firm following a longitudinal approach, using a 5-year rolling window:

1-) ***PERS1_earn_coeff*** and ***PERS2_earn_R2:*** Slope coefficient (β_1) and adjusted R^2 (respectively) from the regression of earnings persistence:

$$Earnings_{t+1} = \beta_0 + \beta_2\, Earnings_t + \varepsilon_t.$$

2-) ***PERS3_disagg_coeff*** and ***PERS4_disagg_R2:*** Slope coefficient (β_1) and adjusted R^2 (respectively) from the regression of the disaggregated earnings persistence:

$$Earnings_{t+1} = \beta_0 + \beta_2\, CFO_t + \beta_2\, TA_t + \varepsilon_t.$$

3-) ***PERS5_CFO_coeff*** and ***PERS6_CFO_R2:*** Slope coefficient (β_1) and adjusted R^2 (respectively) from the regression of cash flows persistence on earnings: (

$$CFO_{t+1} = \beta_0 + \beta_2\, Earnings_t + \varepsilon_t.$$

4-) ***PERS7_var_earn:*** Variance of Earnings Before Extraordinary Items (#18) multiplied by –1 ().

For all of aforementioned equations, variables are defined as follows:

$Earnings_{t+1}$ = Earnings Before Extraordinary Items (#18) at the following fiscal year.

$Earnings_t$ = Earnings Before Extraordinary Items (#18).

CFO_t = Net Operating Cash Flows (#308).

TA_t = Total accruals = $\Delta CA_t - \Delta CL_t - \Delta Cash_t + \Delta STD_t - Dep_t$.

- ΔCA_t = Change in current assets (#4) from the previous year to the current year.
- ΔCL_t = Change in current liabilities (#5) from the previous year to the current year.
- $\Delta Cash_t$ = Change in cash and cash equivalents (#1) from the previous year to the current year.
- ΔSTD_t = Change in debt included in current liabilities (#34) from the previous year to the current year.
- Dep_t = Depreciation and Amortization (Income Statement) (#14)

CFO_{t+1} = Net Operating Cash Flows (#308) at the following fiscal year.

CONSTRUCT 3: ACCRUALS QUALITY (*ACCRUALS_QUALITY*).

All the following indicators are calculated as 1 – absolute value of the residuals from the following regressions, estimated by year-sector:

1-) ***AQ1_Dangelo***: Residuals from DeAngelo (1986) model:

$$TA_t = TA_{t-1} + \varepsilon_t.$$

2-) ***AQ2_Industry:*** Residual from the Industry model by Dechow and Sloan (1991):

$$TA_t = \alpha_1 + \alpha_2\, Median(TA_t) + \varepsilon_t.$$

3-) ***AQ3_Jones:*** Residual from Jones (1991) model:

$$TA_t = \beta_0 + \beta_1(1/AT_{t-1}) + \beta_2\Delta REV_t + \beta_3 PPE_t + \varepsilon_t.$$

4-) ***AQ4_Dechow_95:*** Residual from the Dechow, Sloand and Sweeney (1995) model:

$$TA_t = \beta_0 + \beta_1(1/AT_{t-1}) + \beta_2(\Delta REV_t - \Delta REC_t) + \beta_3 PPE_t + \varepsilon_t.$$

5-) ***AQ5_Kang_Sivaramakrishnan:*** Error term of the Kang and Sivaramakrishnan (1995) model:

$$\frac{ACCBAL_t}{AT_t} = \beta_0 + \beta_1 \frac{REV_t}{AT_t}\left(\frac{ART_{t-1}}{REV_{t-1}}\right) + \beta_2 \frac{EXP_t}{AT_t}\left(\frac{OCAL_{t-1}}{EXP_{t-1}}\right) + \beta_3 \frac{PPE_t}{AT_t}\left(\frac{DEP_{t-1}}{PPE_{t-1}}\right) + \varepsilon_t.$$

6-) ***AQ6_Kasznik:*** Residual from the Kasznik (1999) model:

$$TA_t = \beta_0 + \beta_1(1/AT_{t-1}) + \beta_2\Delta REV_t + \beta_3 PPE_t + \Delta CFO_t + \varepsilon_t.$$

7-) ***AQ7_Dechow_Dichev:*** Residual from the Dechow and Dichev (2002) model:

$$\Delta WC_t = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \varepsilon_t.$$

8-) ***AQ8_Mc_Nichols:*** Residual from the McNichols (2002) model:

$$\Delta WC_t = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4\Delta REV_t + \beta_5 PPE_t + \varepsilon_t.$$

9-) ***AQ9_Dechow_03:*** Residual from the Dechow, Richardson and Tuna (2003) model:

$$TA_t = \alpha_0 + \beta_1((1+\mathrm{k})\Delta REV_t - \Delta REC_t) + \beta_2 PPE_t + \beta_3 \mathrm{TA}_{t-1} + \varepsilon_t.$$

10-) ***AQ10_Larcker:*** Residual from the Larcker and Richardson (2004) model:

$$TA_t = \alpha_0 + \beta_1(1/AT_{t-1}) + \beta_2(\Delta REV_t - \Delta REC_t) + \beta_3 PPE_t + \beta_4 \mathrm{BTM}_t + \beta_5 \mathrm{CFO}_t + \varepsilon_t.$$

11-) ***AQ11_Kothari:*** Residual from the Kothari, Leone and Wasley (2005) model:

$$TA_t = \alpha_0 + \beta_1(1/AT_{t-1}) + \beta_2(\Delta REV_t - \Delta REC_t) + \beta_3 PPE_t + \beta_4 \mathrm{ROA}_{t-1} + \varepsilon_t.$$

12-) ***AQ12_Ball_Shivakumar:*** Residual from the Ball and Shivakumar (2006) model:

$$\Delta WC_t = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4 \Delta REV_t + \beta_5 PPE_t + \beta_6 \mathrm{ROA}_{t-1} + \beta_7\, \Delta CFO_t + \beta_8\, D\Delta CFO_t + \beta_9\, D\Delta CFO_t \cdot \Delta CFO_t + \varepsilon_t.$$

For all of aforementioned equations, variables are defined as follows:

TA_t = Total accruals (Previously calculated)

Median(TA_t) is the median value of total accruals (TA_t) for firms in the same 2-digit SIC code.

TA_{t-1} is total accruals (TA_t) at the beginning of the fiscal year.

AT_{t-1} = Total assets (#6) at the beginning of the fiscal year.

ΔREV_t = Change in net sales (#12) from the previous year to the current year.

PPE_t = PPE total gross (#7).

ΔREC_t = Change in net account receivables (#2) from the previous year to the current year.

$ACCBAL_t$ = non-current assets and liabilities (excluding tax receivables and payables) less depreciation = $CA_t - (CL_t - TXP_t) - Cash_t - TXR_t - Dep_t$.

- ART_t = Accounts receivables less tax receivables = RECt – TXRt
- EXP_t = Expenses = REVt – OIBDPt
- $OCAL_t$ = Other current assets and liabilities = $CA_t - ARTt - (CL_t - TXP_t) - Cash_t - TXR_t$.
    - AT_t = Total assets (#6)
    - REV_t = Net sales (#12)
    - CA_t = Current assets (#4).
    - CL_t = Current liabilities (#5).
    - TXP_t = Income taxes payable (#71).
    - $Cash_t$ = Change in cash and cash equivalents (#1) from the previous year to the current year.
    - TXR_t = Income tax refund (#161).
    - Dep_t = Change in current assets (#14) from the previous year to the current year.
    - REC_t = Accounts receivables (#2).
    - $OIBDP_t$ = Operating Income Before Depreciation (#13).
    - PPE_t = Change in PPE total gross (#7).

ΔCFO_t = Change in Net Operating Cash Flows (#308) from the previous year to the current year.

ΔWCt = Working Capital variation = $\Delta AR_t + \Delta Inventory_t + \Delta AP_t + \Delta TP_t + \Delta Other\ assets_t$.

- ΔAR_t = Change (increase) in accounts receivable (#302).
- $\Delta Inventory_t$ = Change (increase) in inventories (#303).
- ΔAP_t = Change (decrease) in accounts payable (#304).
- ΔTP_t = Change (decrease) in taxes payable (#305).
- $\Delta Other\ assets_t$ = Change (increase) in other assets net (#307).

CFO_{t-1} = Net Operating Cash Flows (#308) at the beginning of the fiscal year.

CFO_t = Net Operating Cash Flows (#308).

CFO_{t+1} = Net Operating Cash Flows (#308) at the following fiscal year.

k = Slope coefficient of the regression of ΔREC_t on ΔREV_t. It captures the change in accounts receivable for a given change in sales.

BTM_t = Book-to-Market ratio = BVt / MVt

- BV_t is book value of common equity (#60)
- MV_t is market value of common equity = Number of common shares outstanding (#25) x Price close of fiscal year (#199).

ROA_{t-1} = Change in the ratio Income Before Extraordinary Items (#18) / total assets at the beginning of the fiscal year (#6).

$DCFO_t$ = Dummy variable = 1 if $\Delta CFO_t < 0$, = 0 otherwise.

NOTE: All variables except BTM and ROA are deflated by total assets at the beginning of the fiscal year, AT_{t-1} (#6).

CONSTRUCT 4: EARNINGS SMOOTHING (*SMOOTH*).

All of the following indicators are calculated for each firm following a longitudinal approach, using a 5-year rolling window:

1-) ***SMOOTH1_dev_earn_cfo:*** Ratio of standard deviation of earnings before extraordinary items (#18) over standard deviation of net operating cash flows (#308).

2-) ***SMOOTH2_corr_accr_cfo:*** Correlation between total accruals (TA_t) (calculated as previously indicated) and net operating cash flows (#308).

CONSTRUCT 5: CONSERVATISM (*CONSERVATISM*) [20].

All of the following indicators are calculated for each firm following a longitudinal approach, using a 5-year rolling window:

1-) ***CONS1_Basu:*** Slope coefficient (β_1) from the model of differential timeliness based on returns by Basu (1997):

$$\frac{EPS_t}{P_{t-1}} = \alpha_0 + \alpha_1\, DR_t + \beta_0\, R_t + \beta_1\, DR_t \cdot R_t + \varepsilon_t.$$

2-) ***CONS2_abs_ear_rev:*** Absolute value of the slope coefficient (β_1) from the model of mean earnings reversal by Basu (1997):

$$\frac{\Delta X_t}{P_{t-1}} = \alpha_0 + \alpha_1\, D_t + \beta_0\, \frac{\Delta X_{t-1}}{P_{t-2}} + \beta_1\, D_t \frac{\Delta X_{t-1}}{P_{t-2}} + \varepsilon_t.$$

3-) ***CONS3_Skew*** Skewness of Earnings Before Extraordinary Items (#18) by Givoly and Hayn (2000).

4-) ***CONS4_Neg_Accr:*** Large negative accruals by Givoly and Hayn (2000): Sum of total accruals (TA_t) (previously calculated).

5-) ***CONS5_MTB:*** Market-to-Book ratio: Value of the MTB_t, previously calculated.

For all of aforementioned equations, variables are defined as follows:

EPS_t = Earnings Per Share (Basic) including Extraordinary Items (#53).

---

[20] There are two additional popular measures for conservatism in previous literature that are not included in our analysis: the metric from Ball and Shivakumar (2005) model and the C-Score from Khan and Watts (2009) model. The reason for excluding these metrics is their strong data requirements, which would be cause an attrition bias problem in our sample.

P_{t-1} = Price from CRSP (Prc) at the beginning of the fiscal year.

P_{t-2} = Price from CRSP (Prc) at the beginning of the previous fiscal year.

R_t = Returns from CRSP (Ret).

DR_t = Dummy variable = 1 if $R_t < 0$, = 0 otherwise.

ΔX_t = Change in Earnings Before Extraordinary Items (#18) from the previous year to the current year.

ΔX_{t-1} = Change in Earnings Before Extraordinary Items (#18) from the previous year to the current year at the beginning of the fiscal year.

D_t = Dummy variable = 1 if $\Delta X_t < 0$, = 0 otherwise.

CHAPTER 5

Conclusions

CHAPTER 5. CONCLUSIONS

5.1 CONCLUSIONS.

According to the objectives for the present doctoral research study and after several theoretical and empirical analysis, we can conclude the following:

1-) The revision of the research reveals that earnings quality is perhaps the most common topic in empirical earnings research (approximately 10% on total number of studies). This vast research warrants the necessity of developing appropriated empirical measures for this concept that allow the extraction of valid conclusions about its causes or consequences. In this sense, it is noteworthy the scant number of studies analysing the validity of earnings quality measurement.

2-) The analysis of earnings quality conceptualization at the conceptual level leads to the conclusion that we cannot find a clear, explicit, unique concept of earnings quality neither by accounting regulators nor by prior literature. What literature talks about, at best, is about different dimensions that are representative of earnings quality (Perotti & Wagenhofer, 2014). Notwithstanding this it is not clear what or how many these dimensions are, nor their relationship with earnings quality.

3-) At the operational level, an outstanding problem of earnings quality is that it is a non-directly observable concept. Prior literature has developed a wide range of heterogeneous empirical proxies that are assumed to represent different dimensions indicative of earnings quality in terms of greater usefulness of accounting information (Dechow et al., 2010; Ewert & Wagenhofer, 2011, 2015; Perotti & Wagenhofer, 2014). Such heterogeneity, however, makes difficult to identify whether these proxies are really representing the same concept, different facets of a single concept, or different concepts (Ewert & Wagenhofer, 2011). Besides, none of them has been proved to fully represent earnings quality nor overcome the rest of proxies (Dechow et al., 2010). Additionally, the research on the relationship between these proxies and the concept of earnings quality (that is, if they are related in a formative or a reflective way) have not been explored in previous literature. Moreover, the scant research on the validity of earnings quality proxies highlights the existence of statistical problems for all of the proxies (Leuz & Wysocki, 2016). Then, none of the proxies is completely appropriately representing the theoretical concept they measure. Furthermore, previous studies point out that different proxies of earnings quality yield opposite results even if they proxy for the same dimension of earnings quality (Ewert & Wagenhofer, 2011), thereby questioning the consistency of the dimensions explained by those proxies. All these things considered, there is the need of analysing the validity of the different measures for the dimensions of earnings quality, determining which the concept that is being measured is and if these proxies are correctly measuring it, as well as how these dimensions are related to earnings quality.

In this regard, there are statistical techniques such as Structural Equation Models (in particular, the Partial Least Squares (PLS) technique) that are applied in other fields of research: psychology, strategic management, management information systems or marketing (Hair et al., 2013; Lee et al., 2011; Sarstedt et al., 2014), as well as in management accounting or behavioural accounting (Hampton, 2015; Lee et al., 2011) and that deal with the measurement of non-directly observable variables

4-) Despite the multidimensional nature of earnings quality, there is a gap in empirical analysis in prior literature as reflected by a vast majority of studies adopting a unidimensional scope for earnings quality measurement (more than 80% of total number of earnings quality studies). These models suffer from misspecification and estimation bias for not considering the rest of earnings quality dimensions that are explicative of the concept. Furthermore, the scant number of papers adopting a multidimensional measure (just around 3% of total number of earnings quality studies) are not including all of the dimensions (or, at best, without a theoretical explanation), with equal weights for all of them (or not justified) and without controlling for their correlations.

5-) The main methods traditionally used to estimate earnings quality suffer from several problems. First of all, single-dimension studies consider that only one of the dimensions is representative to explain earnings quality, without considering the rest of earnings quality dimensions. Additionally, these models assume (without empirically testing it) that the proxies that are used to measure that single relevant characteristics are really measuring this characteristic and not a different one. Secondly, the two multidimensional techniques adopted in prior literature (equally-weighted ranking and common factor) also show estimation problems. The equally-weighted ranking assumes that the characteristics of earnings quality that are included in the index are the only relevant ones and that all of them have the same importance to explain earnings quality. They assume as well that these characteristics are correctly measured by their proxies. Regarding the common factor, this techniques assume (without testing) that there are no different characteristics than the ones that are included in the model and that such characteristics are really measuring earnings quality.

6-) For the reasons previously exposed, we find it necessary to evaluate and assess the internal consistency of the estimation for the different dimensions of earnings quality that is estimated with different proxies representing the same dimension. The PLS method is helpful for that purpose because, with a systematic, double-step process, it first analyses the validity and internal consistency of the concepts that are represented by the proxies and, only after assessing validity and consistency at the measurement level, it assesses the representativeness of the relationships between the different variables (Fornell & Larcker, 1981; Hair et al., 2011; Hair, Tomas, et al., 2016; Henseler et al., 2012; Roldán & Sánchez-Franco, 2012; Ullman, 2006).

7-) Additionally, with a simulation study in which we compare the estimation errors of the three main techniques of earnings quality measurement in prior literature (single-indicator, equally-weighted index and common factor) with the ones from the PLS technique, we demonstrate that PLS yields less biased estimates for earnings quality measurement (smaller estimation errors) than previous methods even in poor-information environments, that is, if some dimensions or indicators for any dimension of earnings quality have not been identified. Consequently, it is expected an improvement of earnings quality measurement with the application of PLS technique.

8-) All these things considered, we propose an empirical analysis for estimating earnings quality with the PLS technique. This technique allows us to empirically validate the measurement validity of the different dimensions of earnings quality. Our model considers that earnings quality is formatively measured by properties of accounting information that are indicative of earnings quality (persistence, accruals quality, earnings smoothing and conservatism) (see for example Dechow et al., 2010; Ewert & Wagenhofer, 2011, 2015; Francis et al., 2004; Perotti & Wagenhofer, 2014; Schipper & Vincent, 2003) and reflectively by the perceived extent of earnings quality by equity investors (Dechow et al., 2010). In addition, earnings quality could be measured reflectively by other indicators such as restatements (Dechow et al., 2010).

9-) The analysis of the empirically tested model of earnings quality using PLS yields the following results:

-Several of the proxies that have been used in prior literature to represent the properties of earnings quality seem not measure the concept that they proxy for appropriately. In particular, there is a noteworthy lack of validity for conservatism proxies.

-The influence of earnings properties to explain the perceived level of earnings quality by equity investors is statistically significant, albeit with a low predictive power, both in sample and out of sample.

-Notwithstanding the general low predictive power for all properties, persistence exhibits a considerably higher power in comparison with the rest of properties of accounting information. Despite this fact, persistence has been used in a lesser extent as a representative dimension of earnings quality in previous empirical studies. Henceforth, future studies could consider the possibility of including more frequently persistence in earnings quality models.

-Accruals quality, which is the property of earnings that is best measured by its indicators, as shown in the different validity tests in PLS analysis, is, however, the property that is less important to explain the perceived level of earnings quality by equity investors. Considering this, we think that future earnings quality studies could use accruals quality as a representative dimension of earnings quality, but correcting the lesser importance that this dimension has to explain the perceived level of earnings quality by equity investors.

10-) To conclude with, we encourage researchers to adopt in further research these kind of methods, given that they ensure the appropriate measurement validity of the variables, also accounting for their extent of importance to explain the dependent variable in terms of predictive power. This way, estimation of earnings quality would be more precise and predictive. Henceforth, the conclusions got from the analysis would be potentially more representative of the real effects of earnings quality on the variable object of study.

5.2 LIMITATIONS.

Our study must be interpreted taking into account that it presents several limitations. Thus, in order to apply the PLS method, we required that all the indicators were measured at the firm-specific level. Despite many of them are usually estimated in a firm-specific way in prior literature, there are various indicators whose typical estimation is not made at this level. One example would be Basu model's coefficients, for which we have used a time-series estimation, despite previous literature has warned about the potential problems associated to this type of estimation for this measure. Then, we cannot determine if the low validity observed for this measure is produced by a real lack of validity or by the estimation method. Additionally, we were unable to use some additional indicators as the C-Score (Khan & Watts, 2009) or the Ball and Shivakumar (2005) measure for conservatism because their inclusion in our study would produce serious attrition problems because of the loss of observations.

A second set of limitations related to our empirical model are produced by the fact that this is a first and exploratory study. Because of this exploratory nature of our study, we included only those earnings properties that are commonly used in previous literature (namely, persistence, accruals quality, smoothness and conservatism), as well as the most commonly used empirical proxies that have been used to represent them. There are, however, other earnings properties that would arguably affect to earnings quality, such as comparability, timeliness, understandability, etc. that were not included in our model, mainly because the lack of research and empirical indicators for representing them. Additionally, our model is also limited in their simplicity: We simply consider a direct relationship between each one of the dimensions and the earnings quality latent variable, but we did not test the existence of indirect or mediated relationships among the different earnings properties. Another limitation is the lack of control variables in our study. Given that our aim was to focus on the validity of the measure of the different earnings properties, we did not include other variables that may influence equity investors' perception of earnings quality. This lack of additional control variables can be the cause for the low explanatory power of the model.

5.3 FUTURE RESEARCH LINES.

To conclude, despite aforementioned limitations, in addition to the proved improvement of earnings quality estimation by using PLS as statistical technique from a theoretical point of view, our doctoral research study contributes offering empirical support for such superiority. Consequently, we aim to use such technique in further research in order to get more accurate conclusions about earnings quality, with higher predictive power and a lower reduction of the bias in estimated parameters. In this regard, future research lines that we aim to develop is the application of PLS to estimate the effects of earnings quality on other dependent variables such as tax effect, investment efficiency, firm performance, cost of equity or cost of debt. This research can be used to provide more robust evidence of the boundaries of PLS in terms of higher predictive power and lower estimation bias, as expected. Furthermore, it can also be useful to revise the validity of the conclusions got in previous empirical studies that focused on a single dimension of earnings quality.

Additionally, this doctoral research study contributes to a validation of the main proxies used in prior literature to measure earnings quality with a systematic process that has been widely employed in other fields of research such as Management Accounting, Marketing or Organizational Behaviour and can also be applied in financial accounting issues such as earnings quality measurement. Thus, we could apply the validation scale process in other fields of finance and accounting.

Furthermore, as previously reflected in conclusions in section 5.1, there is a chance for prior literature to work in the improvement of conservatism measurement. First of all, it is necessary to make it clear what to understand as conservatism. In this sense, it would be interesting to join the efforts of researchers and accounting standards regulators, trying to achieve a common agreement. Secondly, once the concept is clear, future research lines could be orientated to the development of new measures of conservatism that correctly reflect the theoretical concept from an empirical point of view.

Finally, this quantitative analysis could be enriched by a complementary qualitative analysis considering the opinion of experts and practitioners such as auditors, managers, investors or regulators. This would help to deep in the importance given by the different users of accounting information, comparing them with what quantitative analysis indicates.

5.4 REFERENCES FOR CHAPTER 5

Ball, R., & Shivakumar, L. (2005). Earnings quality in UK private firms: comparative loss recognition timeliness. *Journal of Accounting & Economics*, *39*(1), 83–128.

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting & Economics*, *50*(2/3), 344–401.

Ewert, R., & Wagenhofer, A. (2011). *Earnings quality metrics and what they measure* (Working Paper). University of Graz.

Ewert, R., & Wagenhofer, A. (2015). Economic Relations among Earnings Quality Measures. *Abacus*, *51*(3), 311–355.

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(1), 39–50.

Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2004). Costs of Equity and Earnings Attributes. *The Accounting Review*, *79*(4), 967–1010.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *The Journal of Marketing Theory and Practice*, *19*(2), 139–152.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. *Long Range Planning*, *46*(1–2), 1–12.

Hair, J. F., Tomas, G., Hult, M., Ringle, C. M., & Sarstedt, M. (2016). *A primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (2nd ed.). Thousand Oaks, CA: Sage.

Hampton, C. (2015). Estimating and Reporting Structural Equation MOdels with Behavioral Accounting Data. *Behavioral Research in Accounting*, *27*(2), 1–34.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2012). Using partial least squares path modeling in advertising research: basic concepts and recent issues. In S. Okazaki (Ed.), *Handbook of Research on International Advertising* (pp. 252–276). Cheltenham, UK: Edward Elgar.

Khan, M., & Watts, R. L. (2009). Estimation and empirical properties of a firm-year-measure of accounting conservatism. *Journal of Accounting & Economics*, *48*, 132–150.

Lee, L., Petter, S., Fayard, D., & Robinson, S. (2011). On the use of partial least squares path modeling in accounting research. *International Journal of Accounting Information Systems*, *12*(4), 305–328.

Leuz, C., & Wysocki, P. D. (2016). The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research. *Journal of Accounting Research*, *54*(2), 525–622.

Perotti, P., & Wagenhofer, A. (2014). Earnings quality measures and excess returns. *Journal of Business Finance & Accounting*, *41*(5–6), 545–571.

Roldán, J. L., & Sánchez-Franco, M. J. (2012). Variance-based structural equation modeling: Guideliness for using partial least squares in information systems research. In M. Mora, O. Gelman, A. Steenkamp, & M. S. Raisinghani (Eds.), *Research Methodologies, Innovations and Philosophies in Software Systems Engineering and Information Systems* (pp. 193–211). Hershey, PA: IGI Global.

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2014). PLS-SEM: Looking Back and Moving Forward. *Long Range Planning*, *47*(3), 132–137.

Schipper, K., & Vincent, L. (2003). Earnings quality. *Accounting Horizons*, *17*, 97–110.

Ullman, J. B. (2006). Structural Equation Modeling : Reviewing the Basics and Moving Forward. *Journal of Personality Assessment*, *87*(1), 35–50.

REFERENCES

REFERENCES

Artiach, T. C., & Clarkson, P. M. (2011). Disclosure, conservatism and the cost of equity capital: A review of the foundation literature. *Accounting and Finance*, *51*(1), 2–49.

Ashbaugh, H., Collins, D. W., Kinney, W. R. J., & LaFond, R. (2008). The effect of SOX internal control deficiencies and their remediation on accrual quality. *The Accounting Review*, *83*(1), 217–250.

Ashbaugh, H., & Pincus, M. (2001). Domestic accounting standards, international accounting standards, and predictability of earnings. *Journal of Accounting Research*, *39*(3), 417–434.

Babbie, E. (2017). *The basics of social research (7th ed.).* (Cengage, Ed.) (7th ed.). Boston, United States, Boston: Wadsworth Publishing.

Ball, R., Kothari, S. P., & Ashok, R. (2000). The effect of international institutional factors on properties of accounting earnings. *Journal of Accounting & Economics*, *29*(1), 1–51.

Ball, R., & Shivakumar, L. (2005). Earnings quality in UK private firms: comparative loss recognition timeliness. *Journal of Accounting & Economics*, *39*(1), 83–128.

Ball, R., & Shivakumar, L. (2006). The Role of Accruals in Asymmetrically Timely Gain and Loss Recognition. *Journal of Accounting Research*, *44*(2), 207–242.

Bandyopadhyay, S. P., Chen, C., Huang, A. G., & Jha, R. (2010). Accounting Conservatism and the Temporal Trends in Current Earnings' Ability to Predict Future Cash Flows versus Future Earnings: Evidence on the Trade-off between Relevance and Reliability. *Contemporary Accounting Research*, *27*(2), 413.

Barclay, D. W., Higgins, C. A., & Thompson, R. (1995). The partial least squares approach to causal modeling: personal computer adoption and use as illustration.

Technology Studies, *2*(2), 285–309.

Barth, M. E. (2000). Valuation-based accounting research: Implications for financial reporting and opportunities for future research. *Accounting and Finance*, *40*(1), 7–31.

Barth, M. E., Landsman, W. R., & Lang, M. (2008). International Accounting Standards and Accounting Quality. *Journal of Accounting Research*, *46*(3), 467–498.

Barth, M. E., Landsman, W. R., Ravel, V., & Wang, S. (2014). *Conservatism and the information content of earnings*.

Basu, S. (1997). The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting & Economics*, *24*(1), 3–37.

Beatty, A., Petacchi, R., & Zhang, H. (2012). Hedge commitments and agency costs of debt: evidence from interest rate protection covenants and accounting conservatism. *Review of Accounting Studies*, *17*, 700–738.

Beaver, W. H., Correia, M., & McNichols, M. F. (2012). Do differences in financial reporting attributes impair the predictive ability of financial ratios for bankruptcy? *Review of Accounting Studies*, *17*(4), 969–1010.

Beaver, W. H., McNichols, M. F., & Nelson, K. K. (2007). An alternative interpretation of the discontinuity in earnings distributions. *Review of Accounting Studies*, *12*(4), 525–556.

Beaver, W. H., & Ryan, S. G. (2000). Biases and lags in book value and their effects on the ability of the book-to-market ratio to predict book return on equity. *Journal of Accounting Research*, *38*(1), 127–148.

Beaver, W. H., & Ryan, S. G. (2005). Conditional and Unconditional Conservatism:Concepts and Modeling. *Review of Accounting Studies*, *10*(2–3), 267–269.

Becker, J. M., Klein, K., & Wetzels, M. (2012). Hierarchical Latent Variable Models in

PLS-SEM: Guidelines for Using Reflective-Formative Type Models. *Long Range Planning*, *45*(5–6), 359–394.

Becker, J. M., Rai, A., & Rigdon, E. E. (2013). Predictive Validity and Formative Measurement in Structural Equation Modeling: Embracing Practical Relevance. *Thirty Fourth International Conference on Information Systems*, 1–19.

Beidleman, C. R. (1973). Income smoothing: The role of management. *The Accounting Review*, *48*(4), 653–667.

Bhattacharya, N., Ecker, F., Olsson, P., & Schipper, K. (2012). Direct and mediated associations among earnings quality, information asymmetry, and the cost of equity. *The Accounting Review*, *87*(2), 449–482.

Bhattacharya, U., Daouk, H., & Welker, M. (2003). The world price of earnings opacity. *The Accounting Review*, *78*(3), 641–678.

Biddle, G. C., & Hilary, G. (2006). Accounting Quality and Firm-Level Capital Investment. *The Accounting Review*, *81*(5), 963–982.

Bisbe, J., Batista-Foguet, J.-M., & Chenhall, R. (2007). Defining management accounting constructs: A methodological note on the risks of conceptual misspecification. *Accounting, Organizations and Society*, *32*(7–8), 789–820.

Blanthorne, C., Jones-Farmer, L. A., & Almer, E. D. (2006). Why you should consider SEM: A guide to getting started. In V. Arnold, B. D. Clinton, P. Luckett, R. Roberts, C. Wolfe, & S. Wright (Eds.), *Advances in Accounting Behavioral Research* (Vol. 9, pp. 179–207). Emerald Group Publishing, Limited.

Bollen, K. A. (2002). Latent variables in psychology and the social sciences. *Annual Review of Psychology*, *53*, 605–34.

Bollen, K. A., & Bauldry, S. (2011). Three Cs in measurement models: causal indicators, composite indicators, and covariates. *Psychological Methods*, *16*(3), 265–84.

Boterenbrood, R. (2014). Income smoothing by Dutch hospitals. *Journal of Accounting and Public Policy*, *33*, 510–524.

Boulton, T. J., Smart, S. B., & Zutter, C. J. (2011). Earnings Quality and International IPO Underpricing. *The Accounting Review*, *86*(2), 483–505.

Brown, L. D., Call, A. C., Clement, M. B., & Sharp, N. Y. (2015). Inside the "Black Box" of sell-side financial analysts. *Journal of Accounting Research*, *53*(1), 1–47.

Brown, N. C., Pott, C., & Wömpener, A. (2014). The effect of internal control and risk management regulation on earnings quality: Evidence from Germany. *Journal of Accounting and Public Policy*, *33*(1), 1–31.

Burgstahler, D., & Dichev, I. (1997). Earnings management to avoid earnings decreases and losses. *Journal of Accounting & Economics*, *24*(1), 99–126.

Burgstahler, D., Hail, L., & Leuz, C. (2006). The Importance of Reporting Incentives: Earnings Management in European Private and Public Firms. *The Accounting Review*, *81*(5), 983–1016.

Callen, J. L., Segal, D., & Hope, O.-K. (2010). The pricing of conservative accounting and the measurement of conservatism at the firm-year level. *Review of Accounting Studies*, *15*(1), 145–178.

Cano-Rodríguez, M., & Nunez-Nickel, M. (2015). Aggregation bias in estimates of conditional conservatism: Theory and evidence. *Journal of Business Finance and Accounting*, *42*(1–2), 51–78.

Carmines, E. G., & Zeller, R. A. (1979). *Reliability and validity assessment*. *SAGE University Papers on Quantitative Applications in the Social Sciences 07-17*. Beverly Hills, CA: SAGE.

Cepeda, G., & Roldán, J. L. (2013). Modelos de Ecuaciones Estructurales basados en la covarianza y la varianza. In *V Taller de Investigación en Contabilidad de ASEPUC* (pp. 1–34).

Chaney, P. K., Cooil, B., & Jeter, D. (2008). *A latent class model of earnings attributes*.

Chang, H., Suh, S.-H., Werner, E., & Zhou, J. (2012). The effect of SOX on the predictability of future cash flows in litigious and non-litigious industries. *Asia-Pacific Journal of Accounting & Economics*, *19*(2), 210–226.

Chang, W., Franke, G. R., & Lee, N. (2016). Comparing reflective and formative measures: New insights from relevant simulations. *Journal of Business Research*, *69*(8), 3177–3185.

Chen, L. H., Folsom, D. M., Paek, W., & Sami, H. (2014). Accounting conservatism, earnings persistence, and pricing multiples on earnings. *Accounting Horizons*, *28*(2), 233–260.

Chin, W. (1998). The partial least squares approach for estructural equation modeling. . *Modern Methods for Business Researchs*, *Mahwah (NJ*, 295–336.

Chin, W. W. (2010). How to write up and report PLS analyses. In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of Partial Least Squares: Concepts, methods and applications* (pp. 655–690). Berlin, Germany: Springer-Verlag.

Christodoulou, D., Ma, L., & Vasnev, A. (2018). Inference-in-residuals as an Estimation Method for Earnings Management. *Abacus*, *54*(2), 154–180.

Clubb, C., & Wu, G. (2014). Earnings volatility and earnings prediction: Analysis and UK evidence. *Journal of Business Finance & Accounting*, *41*(1–2), 53–72.

Davick, N. S. (2014). The use and misuse of structural equation modeling in management research: A review and critique. *Journal of Advances in Management Research*, *35*(2008), 441–458.

DeAngelo, L. E. (1986). Accounting Numbers as Market Valuation Substitutes: A Study of Management Buyouts of Public Stockholders. *The Accounting Review*, *61*(3), 400–420.

Dechow, P. (1994). Accounting earnings and cash flows as measures of firm performance. *Journal of Accounting & Economics*, *18*(1), 3–42.

Dechow, P., & Dichev, I. (2002). The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, *77*(Supplement), 35–59.

Dechow, P., & Ge, W. (2006). The persistence of earnings and cash flows and the role of special items: Implications for the accrual anomaly. *Review of Accounting Studies*, *11*(2–3), 253–296.

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting & Economics*, *50*(2/3), 344–401.

Dechow, P., Richardson, S., & Tuna, I. (2003). Why Are Earnings Kinky? An Examination of the Earnings Management Explanation. *Review of Accounting Studies*, *8*(2–3), 355–384.

Dechow, P., & Schrand, C. (2004). Earnings quality. *The Research Foundation of CFA Institute*.

Dechow, P., & Skinner, D. J. (2000). Earnings management: Reconciling the views of accounting academics, practitioners, and regulators. *Accounting Horizons*, *14*(2), 235–250.

Dechow, P., & Sloan, R. G. (1991). Executive Incentives and the Horizon Problem: An Empirical Investigation. *Journal of Accounting & Economics*, *14*(1), 51–89.

Dechow, P., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review*, *70*(2), 193–225.

DeFond, M. L. (2010). Earnings quality research: Advances, challenges and future research. *Journal of Accounting & Economics*, *50*(2–3), 402–409.

Degeorge, F., Patel, J., & Zeckhauser, R. (1999). Earnings management to exceed thresholds. *The Journal of Business*, *72*(1), 1–33.

Demerjian, P., Lewis, M., Lev, B., & McVay, S. (2013). Managerial ability and earnings quality. *The Accounting Review*, *88*(2), 463–498.

Diamantopoulos, A., & Winklhofer, H. M. (2001). Index Construction with Formative Indicators: An Alternative to Scale Development. *Journal of Marketing Research*, *38*(2), 269–277.

Dichev, I., & Tang, V. W. (2009). Earnings volatility and earnings predictability. *Journal of Accounting and Economics*, *47*(1–2), 160–181.

Dietrich, J. R., Muller, K. A., & Riedl, E. J. (2007). Asymmetric timeliness tests of accounting conservatism. *Review of Accounting Studies*, *12*(1), 95–124.

Dijkstra, T. K., & Henseler, J. (2015). Consistent and asymptotically normal PLS estimators for linear structural equations. *Computational Statistics and Data Analysis*, *81*, 10–23.

Doupnik, T. S. (2008). Influence of Culture on Earnings Management: A Note. *Abacus*, *44*(3), 317–340.

Durtschi, C., & Easton, P. (2009). Earnings Management? Erroneous Inferences Based on Earnings Frequency Distributions. *Journal of Accounting Research*, *47*(5), 1249–1281.

Ecker, F., Francis, J., Kim, I., Olsson, P., & Schipper, K. (2006). A Returns-Based Representation of Earnings Quality. *The Accounting Review*, *81*(4), 749–780.

Edwards, J. R. (2001). Multidimensional constructs in organizational behavior research: An integrative analytical framework. *Organizational Research Methods*, *4*(2), 144–192.

Edwards, J. R., & Bagozzi, R. P. (2000). On the nature and direction of relationships between constructs and measures. *Psychological Methods*, *5*(2), 155–74.

Ewert, R., & Wagenhofer, A. (2005). Economic Effects of Tightening Accounting Standards to Restrict Earnings Management. *The Accounting Review*, *80*(4), 1101–

1124.

Ewert, R., & Wagenhofer, A. (2011). *Earnings quality metrics and what they measure* (Working Paper). University of Graz.

Ewert, R., & Wagenhofer, A. (2015). Economic Relations among Earnings Quality Measures. *Abacus*, *51*(3), 311–355.

FASB. (1980). Statement of Financial Accounting Concepts. No. 2. Qualitative Characteristics of Accounting Information.

Feltham, G. A., & Ohlson, J. A. (1995). Valuation and clean surplus accounting for operating and financial activities. *Contemporary Accounting Research*, *11*(2), 689.

Ferrer, C., Callao, S., Jarne, I., & Lainez, J. (2016). A Structural Equation Model for Analyzing the Association between some Attributes of Earnings Quality and Value Relevance. *Modeling and Simulation in Engineering, Economics and Management*, *115*, 31–39.

Ferrer, C., & Lainez, J. (2013). Detecting Differences on the Earnings Quality Measurement: Empirical Evidence on Spanish Firms. *Revista de Métodos Cuantitativos Para La Economía y La Empresa*, *16*, 5–28.

Fields, T. D., Lys, T. Z., & Vincent, L. (2001). Empirical research on accounting choice. *Journal of Accounting & Economics*, *31*(1–3), 255–307.

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(1), 39–50.

Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2004). Costs of Equity and Earnings Attributes. *The Accounting Review*, *79*(4), 967–1010.

Francis, J., Nanda, D., & Olsson, P. (2008). Voluntary disclosure, earnings quality and cost of capital. *Journal of Accounting Research*, *46*(1), 53–99.

Francis, J., Olsson, P., & Schipper, K. (2006). Earnings quality. *Foundation and Trends* *in Accounting*, *1*, 259–340.

Francis, J., & Schipper, K. (1999). Have financial statements lost their relevance? *Journal of Accounting Research*, *37*(2), 319–352.

Freeman, R. N., Ohlson, J. A., & Penman, S. H. (1982). Book Rate-of-Return and Prediction of Earnings Changes: An Empirical Investigation. *Journal of Accounting Research*, *20*, 639–653.

Gaio, C., & Raposo, C. (2011). Earnings quality and firm valuation: International evidence. *Accounting and Finance*, *51*(2), 467–499.

García Lara, J. M., García Osma, B., & Mora, A. (2005). The Effect of Earnings Management on the Asymmetric Timeliness of Earnings. *Journal of Business Finance & Accounting*, *32*(3/4), 691–726.

García Lara, J. M., García Osma, B., & Penalva, F. (2009). Accounting conservatism and corporate governance. *Review of Accounting Studies*, *14*(1), 161–201.

García Lara, J. M., García Osma, B., & Penalva, F. (2018). *Accounting conservatism and the limits to earnings management*. *Working Paper*.

García Osma, B., Gill de Albornoz Noguer, B., & Gisbert, A. (2005). La investigación sobre Earnings Managements. *Revista Española de Financiación y Contabilidad*, *34*(127), 1001–1033.

Gassen, J., Uwe Fülbier, R., & Sellhorn, T. (2006). International differences in conditional conservatism - The role of unconditional conservatism and income smoothing. *European Accounting Review*, *15*(4), 527–564.

Gefen, D., Rigdon, E. E., & Straub, D. W. (2011). An Update and Extension to SEM Guidelines for Administrative and Social Science Research. *MIS Quarterly*, *35*(2), iii-A7.

Gefen, D., Straub, D. W., & Boudreau, M.-C. (2000). Structural Equation Modeling and Regression: Guidelines for Research Practice. *Communications of the Association* *for Information Systems*, *4*(1), 7.

Giner, B., & Rees, W. (2001). On the asymmetric recognition of good and bad news in France, Germany and the United Kingdom. *Journal of Business Finance & Accounting*, *28*(9–10), 1285–1331.

Givoly, D., & Hayn, C. (2000). The changing time-series properties of earnings, cash flows and accruals: Has financial reporting become more conservative? *Journal of Accounting & Economics*, *29*(3), 287–320.

Givoly, D., Hayn, C., & Natarajan, A. (2007). Measuring reporting conservatism. *The Accounting Review*, *82*(1), 65–106.

Gow, I. D., Larcker, D. F., & Reiss, P. C. (2016). Causal Inference in Accounting Research. *Journal of Accounting Research*, *54*(2), 477–523.

Guan, L., & Pourjalali, H. (2010). Effect of Cultural Environmental and Accounting Regulation on Earnings Management: A Multiple Year-Country Analysis. *Asia-Pacific Journal of Accounting & Economics*, *17*, 99–127.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *The Journal of Marketing Theory and Practice*, *19*(2), 139–152.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. *Long Range Planning*, *46*(1–2), 1–12.

Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012). The Use of Partial Least Squares Structural Equation Modeling in Strategic Management Research: A Review of Past Practices and Recommendations for Future Applications. *Long Range Planning*, *45*(5–6), 320–340.

Hair, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced Issues in Partial Least Squares Structural Equation Modeling* (2nd ed.). Thousand Oaks, CA, CA: Sage.

Hair, J. F., Tomas, G., Hult, M., Ringle, C. M., & Sarstedt, M. (2016). *A primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (2nd ed.). Thousand Oaks, CA: Sage.

Hampton, C. (2015). Estimating and Reporting Structural Equation MOdels with Behavioral Accounting Data. *Behavioral Research in Accounting*, *27*(2), 1–34.

Healy, P. M., Serafeim, G., Srinivasan, S., & Yu, G. (2014). Market competition, earnings management, and persistence in accounting profitability around the world. *Review of Accounting Studies*, *19*, 1281–1308.

Healy, P. M., & Wahlen, J. M. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*, *13*(4), 365–383.

Henri, J.-F. (2007). A quantitative assessment of the reporting of Structural Equation Modeling Information. The case of management accounting research. *Journal of Accounting Literature*, *26*, 76–115.

Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub, D. W., … Calantone, R. (2014). Common Beliefs and Reality About PLS: Comments on Ronkko and Evermann (2013). *Organizational Research Methods*, *17*(2), 182–209.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2012). Using partial least squares path modeling in advertising research: basic concepts and recent issues. In S. Okazaki (Ed.), *Handbook of Research on International Advertising* (pp. 252–276). Cheltenham, UK: Edward Elgar.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares structural equation modeling in marketing research. *Advances in International Marketing*, *20*, 277–320.

Henseler, J., & Sarstedt, M. (2013). Goodness-of-fit indices for partial least squares path modeling. *Computational Statistics*, *28*(2), 565–580.

Hermanns, S. (2006). *Financial Information and Earnings Quality: a literature review*.

Hinson, L. A., & Utke, S. (2018). *Structural Equation Modeling in Archival Capital Markets Research*.

Höck, C., Sarstedt, M., & Ringle, C. M. (2010). Management of multi-purpose stadiums: importance and performance measurement of service interfaces. *International Journal of Services Technology and Management*, *14*(2/3), 188–207.

Holthausen, R. W., & Watts, R. L. (2001). The relevance of the value-relevance literature for financial accounting standard setting. *Journal of Accounting & Economics*, *31*(1–3), 3–75.

Houmes, R. E., & Skantz, T. R. (2010). Highly Valued Equity and Discretionary Accruals. *Journal of Business Finance & Accounting*, *37*(1/2), 60–92.

Huang, X., Teoh, S. H., & Zhang, Y. (2014). Tone management. *The Accounting Review*, *89*(3), 1083–1113.

IASB. The Conceptual Framework for Financial Reporting (2010). London.

Imhoff, E. A. (2003). Accounting quality, auditing, and corporate governance. *Accounting Horizons*, *17*, 117–128.

Jackson, A. B. (2018). Discretionary Accruals: Earnings Management ... or Not? *Abacus*, *54*(2), 136–153.

Jackson, S. B. (2008). The effect of firms' depreciation method choice on managers' capital investment decisions. *The Accounting Review*, *83*(2), 351–376.

Jackson, S. B., & Cechinni, M. (2009). Economic consequences of firms' depreciation method choice: evidence from capital investments. *Journal of Accounting and Economics*, *48*(1), 54–68.

Jackson, S. B., & Liu, X. (2010). The Allowance for Uncollectible Accounts, Conservatism, and Earnings Management. *Journal of Accounting Research*, *48*(3), 647–686.

Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research*, *30*(2), 199–218.

Jones, J. J. (1991). Earnings Management During Import Relief Investigations. *Journal of Accounting Research*, *29*(2), 193–228.

Jones, K. L., Krishnan, G. V, & Melendrez, K. D. (2008). Do Models of Discretionary Accruals Detect Actual Cases of Fraudulent and Restated Earnings? An Empirical Analysis. *Contemporary Accounting Research*, *25*(2), 6.

Jung, B., Lee, W.-J., & Weber, D. P. (2014). Financial reporting quality and labor investment efficiency. *Contemporary Accounting Research*, *31*(4), 1047–1076.

Kang, S.-H., & Sivaramakrishnan, K. (1995). Issues in testing earnings management and an instrumental variable approach. *Journal of Accounting Research*, *33*(2), 353–367.

Kasznik, R. (1999). On the association between voluntary disclosure and earnings management. *Journal of Accounting Research*, *37*(1), 57–80.

Khan, M., & Watts, R. L. (2009). Estimation and empirical properties of a firm-year-measure of accounting conservatism. *Journal of Accounting & Economics*, *48*, 132–150.

Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting & Economics*, *39*(1), 163–197.

LaFond, R., & Watts, R. L. (2008). The Information Role of Conservatism. *The Accounting Review*, *83*(2), 447–478.

Laksmana, I., & Yang, Y. (2009). Corporate citizenship and earnings attributes. *Advances in Accounting*, *25*(1), 40–48.

Larcker, D. F., & Richardson, S. (2004). Fees Paid to Audit Firms, Accrual Choices, and Corporate Governance. *Journal of Accounting Research*, *42*(3), 625–658.

Larcker, D. F., & Rusticus, T. O. (2010). On the use of instrumental variables in accounting research. *Journal of Accounting and Economics*, *49*(3), 186–205.

Lee, L., Petter, S., Fayard, D., & Robinson, S. (2011). On the use of partial least squares path modeling in accounting research. *International Journal of Accounting Information Systems*, *12*(4), 305–328.

Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: an international comparison. *Journal of Financial Economics*, *69*(3), 505–527.

Leuz, C., & Wysocki, P. D. (2016). The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research. *Journal of Accounting Research*, *54*(2), 525–622.

Li, Y., Niu, J., Zhang, R., & Largay, J. A. (2011). Earnings Management and the Accrual Anomaly: Evidence from China. *Journal of International Financial Management & Accounting*, *22*(3), 205–245.

Libby, R., Bloomfield, R., & Nelson, M. W. (2002). Experimental research in financial accounting. *Accounting, Organizations and Society*, *27*(8), 775–810.

MacKenzie, S. B., Podsakoff, P. M., & Jarvis, C. B. (2005). The problem of measurement model misspecification in behavioral and organizational research and some recommended solutions. *Journal of Applied Psychology*, *90*(4), 710–730.

Mackenzie, S. B., Podsakoff, P. M., & Podakoff, N. P. (2011). Construct measurement and validation procedures in mis and behavioral research: integrating new and existing techniques. *MIS Quarterly*, *35*(2), 293–334.

Mateos-Aparicio, G. (2011). Partial Least Squares (PLS) Methods: Origins, Evolution, and Application to Social Sciences. *Communications in Statistics - Theory and Methods*, *40*(13), 2305–2317.

McNichols, M. F. (2000). Research design issues in earnings management studies. *Journal of Accounting and Public Policy*, *19*(4,5), 313–345.

McNichols, M. F. (2002). Discussion of The Quality of Accruals and Earnings: The Role of Accruals Estimation Errors. *The Accounting Review*, *77*(Supplement), 61–69.

McNichols, M. F., & Stubben, S. R. (2018). Research Design Issues in Studies Using Discretionary Accruals. *Abacus*, *54*(2), 227–246.

Mora, A., & Walker, M. (2015). The Implications of Research on Accounting Conservatism for Accounting Standard Setting. *Accounting & Business Research*, *45*(5), 620–650.

Nelson, M. W., Elliot, J., & Tarpley, R. (2003). How are earnings managed? Examples from auditors. *Accounting Horizons*, *17*, 17–35.

Nitzl, C. (2016). The use of partial least squares structural equation modelling (PLS-SEM) in management accounting research: Directions for future theory development. *Journal of Accounting Literature*, *37*, 19–35.

Numally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York, NY: Mc Graw Hill.

Pae, J. (2007). Unexpected accruals and conditional accounting conservatism. *Journal of Business Finance & Accounting*, *34*(5–6), 681–704.

Patatoukas, P. N., & Thomas, J. K. (2011). More Evidence of Bias in the Differential Timeliness Measure of Conditional Conservatism. *The Accounting Review*, *86*(5), 1765–1793.

Penman, S. H. (2003). The quality of financial statements: Perspectives from the recent stock market bubble. *Accounting Horizons*, *17*, 77–96.

Penman, S. H., & Zhang, X.-J. (2002). Accounting conservatism, the quality of earnings, and stock returns. *The Accounting Review*, *77*(2), 237–264.

Perotti, P., & Wagenhofer, A. (2014). Earnings quality measures and excess returns. *Journal of Business Finance & Accounting*, *41*(5–6), 545–571.

Reinartz, W., Haenlein, M., & Henseler, J. (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of Research in Marketing*, *26*(4), 332–344.

Richardson, S., Sloan, R. G., Soliman, M. T., & Tuna, I. (2005). Accrual reliability, earnings persistence and stock prices. *Journal of Accounting and Economics*, *39*, 437–485.

Rigdon, E. E. (2012). Rethinking Partial Least Squares Path Modeling: In Praise of Simple Methods. *Long Range Planning*, *45*(5–6), 341–358.

Rigdon, E. E. (2014). Rethinking Partial Least Squares Path Modeling: Breaking Chains and Forging Ahead. *Long Range Planning*, *47*(3), 161–167.

Rigdon, E. E. (2016). Choosing PLS path modeling as analytical method in European management research: A realist perspective. *European Management Journal*, 1–8.

Ringle, C. M., & Sarstedt, M. (2016). Gain more insight from your PLS-SEM results. *Industrial Management & Data Systems*, *116*(9), 1865–1886.

Ringle, C. M., Sarstedt, M., & Schlittgen, R. (2014). Genetic algorithm segmentation in partial least squares structural equation modeling. *OR Spectrum*, *36*(1), 251–276.

Ringle, C. M., Sarstedt, M., & Straub, D. W. (2012). A critical look at the use of PLS-SEM in MIS Quarterly. *MIS Quarterly*, *36*(1), 3–14.

Rodgers, W., & Guiral, A. (2011). Potential model misspecification bias: Formative indicators enhancing theory for accounting researchers. *The International Journal of Accounting*, *46*(1), 25–50.

Roldán, J. L., & Sánchez-Franco, M. J. (2012). Variance-based structural equation modeling: Guideliness for using partial least squares in information systems research. In M. Mora, O. Gelman, A. Steenkamp, & M. S. Raisinghani (Eds.), *Research Methodologies, Innovations and Philosophies in Software Systems Engineering and Information Systems* (pp. 193–211). Hershey, PA: IGI Global.

Rönkkö, M., & Evermann, J. (2013). A critical examination of common beliefs about partial least squares path modeling. *Organizational Research Methods*, *16*(3), 425–448.

Roychowdhury, S., & Watts, R. L. (2007). Asymmetric timeliness of earnings, market-to-book and conservatism in financial reporting. *Journal of Accounting & Economics*, *44*(1/2), 2–31.

Ruch, G. W., & Taylor, G. (2015). Accounting conservatism: a review of the literature. *Journal of Accounting Literature*, *34*(1), 17–38.

Ryan, S. G. (2006). Identifying conditional conservatism. *European Accounting Review*, *15*(4), 511–525.

Sarstedt, M., Hair, J. F., Ringle, C. M., Thiele, K. O., & Gudergan, S. P. (2016). Estimation issues with PLS and CBSEM: Where the bias lies! *Journal of Business Research*, *69*(10), 3998–4010.

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2014). PLS-SEM: Looking Back and Moving Forward. *Long Range Planning*, *47*(3), 132–137.

Schipper, K., & Vincent, L. (2003). Earnings quality. *Accounting Horizons*, *17*, 97–110.

Sloan, R. G. (1996). Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review*, *71*, 289–315.

Smith, D., & Langfield-Smith, K. (2004). Structural Equation Modeling in Management Accounting Research: Critical Analysis and Opportunities. *Journal of Accounting Literature*, *23*, 49–86.

Tabachnick, & Fidell. (2007). *Using multivariate statistics* (5th ed.). Boston, Netherlands, Boston: Allyn & Bacon / Pearson Education.

Tenenhaus, M., Vinzi, V. E., Chatelin, Y. M., & Lauro, C. (2005). PLS path modeling. *Computational Statistics and Data Analysis*, *48*(1), 159–205.

Thomas, J., & Zhang, X. (2000). Identifying unexpected accruals: A comparison of current approaches. *Journal of Accounting and Public Policy*, *19*(4,5), 347–376.

Tucker, J. W., & Zarowin, P. (2006). Does Income Smoothing Improve Earnings Informativeness? *The Accounting Review*, *81*(1), 251–270.

Ullman, J. B. (2006). Structural Equation Modeling : Reviewing the Basics and Moving Forward. *Journal of Personality Assessment*, *87*(1), 35–50.

VanTendeloo, B., & Vanstraelen, A. (2008). Earnings Management and Audit Quality in Europe: Evidence from the Private Client Segment Market. *European Accounting Review*, *17*(3), 447–469.

Wang, Q., Ettredge, M., Huang, Y., & Sun, L. (2011). Strategic revelation of differences in segment earnings growth. *Journal of Accounting and Public Policy*, *30*(4), 383–392.

Wang, R. Z., Hogartaigh, C. O., & Van Ziji, T. (2009). Measures of Accounting Conservatism: A construct validity perspective. *Journal of Accounting Literature*, *28*, 165–203.

Watts, R. L. (2003). Conservatism in accounting part I: Explanations and implications. *Accounting Horizons*, *17*(3), 207–221.

Wetzels, M., & Odkerken-Schröder, G. (2009). Using PLS Path Modeling for Assessing Hierarchical Construct Models: Guidelines and Empirical Illustration. *MIS Quarterly*, *33*(1), 177–195.

Wilson, M. (2011). Earnings management in Australian corporations. *Australian Accounting Review*, *21*(3), 205–221.

Wittenberg-Moerman, R. (2008). The role of information asymmetry and financial reporting quality in debt trading. *Journal of Accounting & Economics*, *46*, 240–260.

Wold, H. (1980). Model Construction and Evaluation When Theoretical Knowledge is scarce. *Bureau of Economic Research*, 47–74.

Wold, H. (1982). Soft modeling: the basic design and some extensions. In K. G. Jöreskog & H. Wold (Eds.), *Systems under Indirect Observation: Causality, Structure, Prediction, vol. 2. North Holland, Amsterdam* (pp. 1–54). Amsterdam: North-Hollandl.

Wold, H. (1985). Systems Analysis by Partial Least Squares. *Measuring the Unmeasurable*, (September), 713.

Wright, R. T., Campbell, D. E., Thatcher, J. B., & Roberts, N. (2012). Operationalizing Multidimensional Constructs in Structural Equation Modeling : Recommendations for IS Research Operationalizing Multidimensional Constructs in Structural Equation Modeling : Recommendations for IS Research. *Comunications of the Association for Information System*, *30*, 367–412.

Yeo, G. H. H., Tan, P. M. S., Ho, K. W., & Chen, S.-S. (2002). Corporate ownership structure and the informativeness of earnings. *Journal of Business Finance & Accounting*, *29*(7/8), 1023–1046.

Zhang, J. (2008). The contracting benefits of accounting conservatism to lenders and borrowers. *Journal of Accounting and Economics*, *45*(1), 27–54.

RESUMEN DE LA TESIS DOCTORAL EN ESPAÑOL

RESUMEN DE LA TESIS DOCTORAL EN ESPAÑOL

MOTIVACIÓN DE LA INVESTIGACIÓN.

La calidad del resultado contable es uno de los temas más recurrentes en investigación en contabilidad. Aun así, el hecho de que sea un concepto no directamente observable dificulta su medición. La adopción de una adecuada técnica para la medición de la calidad del resultado, dada la importancia de este tema en literatura, es crucial ya que la validez de las conclusiones que se obtienen en estudios empíricos sobre las causas o consecuencias de la calidad del resultado podrían verse afectadas.

La presenta tesis doctoral presenta una revisión en profundidad de la medición de la calidad del resultado, analizando el estado actual de la investigación y ofreciendo nuevos paradigmas sobre técnicas recientes que son potencialmente más adecuadas a tal objeto, dadas las características de la calidad del resultado.

Nuestro trabajo contribuye a la literatura previa desde un punto de vista teórico con un análisis detallado del estado de la cuestión sobre medición de la calidad del resultado desde un punto de vista multidimensional. Esta revisión pone de manifiesto que existe un consenso sobre la naturaleza multidimensional de la calidad del resultado, puesto que existen diversas dimensiones que son indicativas de calidad del resultado, sin ser ninguna de ellas superior al resto ni ser tampoco suficientemente completa como para representarlo en su totalidad (véase por ejemplo Dechow, Ge, & Schrand, 2010; Dechow & Schrand, 2004; Francis, LaFond, Olsson, & Schipper, 2004; Francis & Schipper, 1999; Perotti & Wagenhofer, 2014). Dicho consenso teórico, sin embargo, no se refleja a nivel de estudios empíricos que tratan de medir la calidad del resultado, puesto que la mayoría de modelos de estos estudios analiza una única dimensión de calidad del resultado, adoptando por tanto un enfoque de corte unidimensional.

Para cubrir este gap entre el concepto teórico de calidad del resultado y su medición empírica, revisamos el marco para la investigación empírica basada en teoría en las Ciencias Sociales, aplicando dicho marco a la medición de la calidad del resultado. Por tanto, mediante la revisión de la conceptualización de la calidad del resultado, encontramos una serie de problemas. En primer lugar, observamos que no hay un concepto claro, único y explícito de calidad del resultado ni en legislación contable ni en literatura previa. Así, la literatura habla de calidad del resultado refiriéndose a una serie de propiedades que son indicativas de un mayor grado de utilidad de la información contable para diferentes resultados de un proceso de decisión (Dechow et al., 2010; Perotti & Wagenhofer, 2014) tales como el ingreso en sentido amplio (Schipper & Vincent, 2003), la actuación de la empresa (Dechow & Schrand, 2004; Demerjian, Lewis, Lev, & McVay, 2013) o la eficiencia de mercado (Ewert & Wagenhofer, 2011; Fields, Lys, & Vincent, 2001). En segundo lugar, aunque la literatura sobre este tema de investigación reconoce la existencia de varias dimensiones relacionadas con calidad del resultado, las relaciones entre dichas dimensiones entre sí o de éstas con calidad del resultado no están claras. En tercer lugar, hay diferentes medidas empíricas para representar cada dimensión pero una ausencia de análisis desde el punto de vista teórico acerca de la validez de cada una de ellas, así como de su habilidad para representar de manera precisa el concepto analizado (Perotti & Wagenhofer, 2014), y diferentes estudios han dado resultados contradictorios para medidas que representan el mismo concepto (Ewert & Wagenhofer, 2011). En cuarto lugar, se ha demostrado que los modelos usados anteriormente en literatura para medir calidad del resultado (tanto uni- como multidimensionales) no cumplen satisfactoriamente su objetivo debido a una incorrecta especificación o a sesos de estimación por variables correlacionadas omitidas. La especificación incorrecta tiene importantes implicaciones también desde un punto de vista empírico ya que los resultados del análisis de calidad del resultado con otras variables reflejarían conclusiones que no son precisas (Chang, Franke, & Lee, 2016; Jarvis, MacKenzie, & Podsakoff, 2003; MacKenzie, Podsakoff, & Jarvis, 2005). Finalmente, concluimos que el uso de técnicas más sofisticadas para la medición de calidad del resultado es un clamor, ya que los modelos de primera generación (en particular, Mínimos Cuadrados Ordinarios (Ordinary Least Squares, OLS)) no son capaces de modelizar relaciones complejas entre diferentes variables de manera simultánea (Gefen, Rigdon, & Straub, 2011; Lee, Petter, Fayard, & Robinson, 2011; Nitzl, 2016; Smith & Langfield-Smith, 2004). En definitiva, la investigación empírica puede beneficiarse de técnicas de estimación más rigurosas para medir calidad del resultado, que representan de manera precisa el concepto y permiten la extracción de conclusiones válidas del análisis con otras variables para futuros trabajos de investigación.

Con el propósito de mejorar la medición de la calidad del resultado, llevamos a cabo un estudio empírico que utiliza modelos de regresión de segunda generación (en particular, Mínimos Cuadrados Parciales (Partial Least Squares –PLS–)) para la medición de la calidad del resultado. PLS ha sido utilizado de manera extensiva en otras disciplinas en Ciencias Sociales tales como Contabilidad Directiva, Psicología, Dirección Estratégica, Sistemas de Información para la Dirección, o Marketing (Hair, Ringle, & Sarstedt, 2011, 2013; Lee et al., 2011; Sarstedt, Ringle, & Hair, 2014). Estas disciplinas han aprovechado la capacidad de PLS para representar empíricamente variables que no son directamente observables (variables latentes) a través de medidas empíricas (indicadores), incorporando tantas medias como sean necesarias con una ponderación apropiada para cada una de ellas de acuerdo a su importancia para explicar el concepto (Hair, Sarstedt, Pieper, & Ringle, 2012; Henseler, Ringle, & Sinkovics, 2009; Lee et al., 2011; Nitzl, 2016; Smith & Langfield-Smith, 2004). Además, PLS se usa en Ciencias Sociales como un método para validad de manera rigurosa las medidas empíricas de cualquier concepto teórico (Hair et al., 2012; Henseler, Ringle, & Sarstedt, 2012; Nitzl, 2016). Por esa razón, hacemos una contribución a la literatura previa desde un punto de vista empírico mediante la proposición y demostración empírica de un modelo para la medición de la calidad del resultado que incluye las principales medidas usadas en literatura. Siguiendo el proceso de validación de escala (Diamantopoulos & Winklhofer, 2001) evaluamos de manera sistemática la validez de la medición de la calidad del resultado. Más aún, aportamos evidencia empírica de la superioridad de PLS sobre otros modelos de estimación usados previamente en cuanto a una mayor capacidad predictiva del modelo tanto para la muestra como para la inferencia, así como una reducción del sesgo de estimación. La importancia de nuestro estudio empírico es que permite una medición de la calidad del resultado de mayor precisión, incluyendo todas las medidas que representan apropiadamente la dimensión de la calidad del resultado que están midiendo, y considerando explícitamente la interrelación entre las diferentes dimensiones. Además, este modelo estima la ponderación óptima para cada medida y dimensión de acuerdo a la importancia que tienen para explicar la calidad del resultado.

Resumiendo, este estudio de tesis doctoral analiza la complejidad de la medición de la calidad del resultado, resaltando los principales problemas de los modelos usados previamente en literatura y proponiendo una nueva metodología para su estimación. La aplicación de dicha metodología se espera que ayude a superar dichos problemas, permitiendo una estimación de la calidad del resultado menos sesgada y más potente, considerando todas sus dimensiones representativas. Más aún, se asegura la validez de las medidas incluidas en el modelo tras haber analizado tal validez mediante un proceso riguroso y sistemático. Esto tiene implicaciones tanto para investigadores como para profesionales. Para investigadores, cuestiona la validez de las conclusiones obtenidas en análisis previos con modelos de medición de la calidad del resultado menos preciosos y abre una nueva posibilidad para definir modelos que tengan mayor validez. Además, se ayuda a identificar aquellas dimensiones clave que son más importantes para el proceso de toma de decisiones por parte de los diferentes grupos de interés de una empresa, así como aquellas otras dimensiones que son menos relevantes. Para los profesionales, la mayor precisión en la estimación de la calidad del resultado puede ayudarles a orientar sus decisiones basadas en contabilidad de manera que trabajen en aquellas que tienen mayor impacto en la decisión del inversor. Así, por ejemplo, los reguladores pueden identificar la posible interacción entre diferentes dimensiones de la calidad del resultado, pudiendo estudiar cómo las normas y principios que tratan de afectar a algunas de esas dimensiones pueden tener también efectos secundarios en otras dimensiones. Además, los supervisores de la calidad de los estados financieros (empresas auditoras, agentes de inspección y supervisión…) pueden de igual modo beneficiarse de un análisis multidimensional de la calidad del resultado, ya que sus conclusiones estarían teniendo en cuanta una mayor variedad de factores que determinan la calidad del resultado, todos ellos habiendo sido validados como instrumentos válidos y precisos para representar la calidad del resultado.

OBJETIVOS DE INVESTIGACIÓN.

El objetivo principal de esta investigación doctoral es analizar la medición de la calidad del resultado contable desde un punto de vista multidimensional, proponiendo una solución a los modelos usados anteriormente en literatura. Esta solución consiste en la aplicación de Mínimos Cuadrados Parciales (Partial Least Squares (PLS)), como un modelo holístico que posibilita un enfoque multidimensional para la estimación de la calidad del resultado. Ésta es una técnica de investigación que, a pesar de ser ampliamente utilizada en otras disciplinas de las Ciencias Sociales, no ha sido muy usada en el ámbito de la investigación en contabilidad financiera. Utilizaremos también la aplicación de este método para comprobar de manera rigurosa y sistemática la validez de las principales medidas empíricas que se han usado en literatura previa.

Más en detalle, podemos sintetizar los objetivos específicos de investigación como sigue:

1-) Análisis del estado de la cuestión en la investigación sobre calidad del resultado. Con este objetivo pretendemos:

-Llevar a cabo una revisión de literatura de los estudios de la calidad resultado contable en revistas científicas contables incluidas en el Journal of Citation Report, identificando las principales medidas que se han utilizado en literatura previa para representar empíricamente la calidad del resultado, así como los modelos y técnicas estadísticas que se han empleado.

-Realizar una revisión crítica de esas medidas de calidad del resultado, poniendo de manifiesto sus problemas y los modelos y técnicas estadísticas que han sido usados para su estimación.

2-) Analizar la validez de la conceptualización de la calidad del resultado. Con este objetivo pretendemos:

-Estudiar las diferentes definiciones del concepto de calidad del resultado que se han usado tanto en normativa y legislación contable como en literatura previa.

-Analizar si la forma en la cual los investigadores han medido empíricamente la variable "calidad del resultado" es apropiada y consistente con la definición del término.

-Testar la validez de la conceptualización (tanto a nivel conceptual como operacional) de los modelos usados previamente para la medición de la calidad del resultado, comparando sus errores de estimación.

-Proponer un método apropiado para la medición de la calidad del resultado y validar empíricamente sus bondades sobre otros modelos previos, en comparación con dichos modelos usados anteriormente, mediante un análisis de simulación.

3-) Validación empírica del método propuesto para medir la calidad del resultado, utilizado datos de archivo de los estados financieros de una muestra de empresas. Con este objetivo pretendemos:

-Revisar la adecuación de las diferentes medidas de calidad del resultado que se han empleado previamente en investigación en contabilidad para representar de manera precisa el concepto teórico que se pretende medir, indicando los casos en que no existe una correspondencia entre el indicador empírico y la variable latente de la dimensión analizada.

-Analizar la consistencia interna de las diferentes medidas para cada dimensión, comprobando si esas medidas se refieren a conceptos iguales o diferentes, y si ese concepto es explicado de manera correcta por dichas medidas.

-Ofrecer evidencia empírica acerca de las bondades de las técnicas que han sido utilizadas previamente en literatura para medir calidad del resultado, frente a técnicas más sofisticadas que adoptan un enfoque de corte multidimensional para la medición de la calidad del resultado.

4-) Desarrollo de una metodología para definir una medida multidimensional de calidad del resultado. Con este objetivo pretendemos:

-Desarrollar una medida multidimensional que incluya las diferentes facetas de la calidad del resultado, controlando la potencial correlación entre ellas y permitiendo la inclusión de diferentes medidas empíricas para cada una de estas dimensiones.

-Comparar la capacidad predictiva de los modelos tradicionales de medición de la calidad del resultado frente a nuestro nuevo modelo propuesto, comprobando si, como se espera, el nuevo modelo aumenta el poder de estimación reduciendo el sesgo de estimación.

-Comprobar que el nuevo modelo es capaz de explicar de manera correcta algunas variables que son consideradas como consecuencia de calidad del resultado (en particular, la respuesta del inversor a la información contable y las rectificaciones de estados contables tras la opinión de auditoría).

RESUMEN DEL CONTENIDO DE LA TESIS DOCTORAL POR CAPÍTULOS.

CAPÍTULO SEGUNDO.

El Capítulo 2 ("Marco teórico. Una revisión del análisis multidimensional de la calidad del resultado") presenta una revisión de la investigación sobre medición de la calidad del resultado contable, centrada especialmente en su naturaleza multidimensional. Este capítulo describe el proceso de revisión bibliométrica, clasificando los diferentes estudios de acuerdo a los cuales se analizan las diferentes dimensiones de calidad del resultado. Se han examinado 18 revistas científicas incluidas en el Journal of Citation Reports (JCR) 2014 publicadas entre 2000 y 2014. El criterio para selección de artículos ha sido el siguiente: (1) El título, resumen o palabras clave deben reflejar contenido relativo a la calidad del resultado. (2) El artículo debe tratar bien de un estudio empírico, bien de un estudio metodológico. (3) El tema analizado debe incluir específicamente calidad del resultado, descartando otros que tratan temas similares como pueden ser calidad de auditoría, calidad de previsión de analistas, información voluntaria, o calidad del sistema de contabilidad directiva de la empresa. De acuerdo con ese criterio se han analizado 6214 artículos, de los cuales 618 (9.9% del total) tratan sobre calidad del resultado, evidenciando la importancia de este tema en el mundo de la investigación en contabilidad. De los 618 artículos, 572 (92.6%) son empíricos, frente a los restantes 46 (7.4%) que pueden considerarse como metodológicos, ya que no analizan empíricamente calidad del resultado pero analizan diferentes aspectos teóricos de la misma tales como al relación entre propiedades de la información contable o sus causas o consecuencias. Todo el capítulo se centra en los 572 artículos empíricos ya que el objetivo es un análisis multidimensional de la medición de la calidad del resultado.

Posteriormente describimos las diferentes propiedades que son indicativas de calidad del resultado, así como los principales indicadores que se han utilizado en estudios previos para representar dichas propiedades. Se sigue para ello la clasificación de Dechow et al. (2010), quienes establecen tres dimensiones: propiedades del resultado contable (grado de manipulación del resultado, alisamiento del resultado, previsibilidad (persistencia) del resultado y conservadurismo), respuesta del inversor frente a la información financiera (coeficiente de respuesta del inversor (Earnings Response Coefficient (ERC)) e indicadores de errores en la divulgación de información contable evidenciados por autoridades externas a la empresa (rectificaciones de estados contables tras la auditoría o debilidades de control interno, entre otros). De los 572 artículos analizados, un total de 472 (82.5%) miden calidad contable a través de una o varias medidas de propiedades del resultado contable, 81 artículos (14.2%) utilizan medidas de reacción del inversor, y sólo 19 artículos (3.3%) usan otros indicadores de errores. Por tanto, el análisis de este capítulo se centra en los 472 estudios que utilizan alguna medida dentro de la categoría de propiedades del resultado contable.

A continuación, estudiamos los diferentes métodos utilizados por los investigadores para medir calidad del resultado desde un punto de vista tano unidimensional como multidimensional, analizando la técnica empleada y los problemas asociados a cada forma de estimar calidad del resultado. Vemos cómo a pesar de la reconocida naturaleza multidimensional de la calidad del resultado contable, la mayoría de estudios son de corte unidimensional. Así, 334 de los 472 estudios (70.8%) considera una única propiedad del resultado, y dentro de este grupo, la distribución de la propiedad analizada no es uniforme pues se basa primordialmente en manipulación del resultado (225/334: 70.4%) y, en menor proporción, conservadurismo condicional (49/334: 14.7%). El resto de propiedades son mucho menos analizadas en los estudios empíricos. Otro grupo de estudios de corte unidimensional (107 de los 472: 22.7%) analizan varias propiedades pero en diferentes regresiones. Por tanto, más del 90% de los artículos presentan un enfoque unidimensional. Mediante desarrollo econométrico se demuestra que este tipo de enfoque que sustituye la calidad del resultado por un único componente del mismo producirá probablemente estimaciones sesgadas, tanto cuando la calidad contable es variable explicativa como cuando es variable explicada. Es más, incluso si el objetivo del investigador es analizar el efecto de una única propiedad del resultado sobre otra variable (y no como tal calidad del resultado) el resultado estará también sesgado debido a la omisión de variables correlacionadas omitidas en el modelo. Dentro del enfoque multidimensional, incluimos estudios que analizan empíricamente la relación entre propiedades del resultado (19 de los 472 artículos: 4%), así como trabajos que utilizan realmente una medida multidimensional (12 de los 472 artículos: 2.5%). Los trabajos sobre relación entre propiedades muestran la existencia de correlaciones no negativas entre todas las propiedades, si bien no existe un acuerdo común sobre el signo de dicha correlación para la mayoría de pares de propiedades analizadas. En cuanto a los trabajos con medidas multidimensionales presentan una serie de problemas señalados por Leuz and Wysocki (2016) que en esencia se resumen en los siguientes: selección subjetiva de las medidas incluidas, ponderación subjetivas (o sin razonamiento teórico) de las medidas, falta de análisis de la correlación entre medidas e incapacidad de solventar los problemas de medición de las medidas por la mera agregación de las mismas. Demostramos también econométricamente cómo el uso de este tipo de medidas multidimensionales lleva a un sesgo de estimación.

CAPÍTULO TERCERO.

El Capítulo 3 (“Metodología y diseño de investigación: Una propuesta de conceptualización de la calidad del resultado”) justifica y explica la metodología que proponemos como conclusión en el Capítulo 2, los Modelos de Ecuaciones Estructurales (Structural Equation Models, SEM), como un método apropiado de estimación para la medición de la calidad del resultado. Comenzamos este capítulo con una visual a las diferentes técnicas de SEM (Modelos de Ecuaciones Estructurales

Basados en la Covarianza (CB-SEM) y Modelos de Ecuaciones Estructurales Basados en la Varianza o Mínimos Cuadrados Parciales (PLS)), explicando sus diferencias. La elección de uno u otro método como más apropiado para estimar calidad del resultado debe estar marcada por su adecuación en cuanto a condiciones y objetivos de investigación de la variable objeto de estudio en SEM (Roldán & Sánchez-Franco, 2012). En base a las características de CB-SEM y PLS, consideramos más apropiado en enfoque PLS dada su menor exigencia a nivel de requisitos estadísticos y, principalmente, la posibilidad que ofrece de trabajar con relaciones formativas entre las variables, las cuales son inviables en CB-SEM (Gefen et al., 2011; Gefen, Straub, & Boudreau, 2000; Henseler et al., 2012) pero posibles (y recomendables) en PLS (Henseler et al., 2012; Henseler & Sarstedt, 2013).

Una vez justificado el método teóricamente más apropiado para la medición de la calidad del resultado, revisamos específicamente qué se ha realizado en literatura sobre medición de la calidad del resultado. Así, comenzamos con la descripción de la conceptualización del proceso para representar empíricamente cualquier variable que no sea directamente observable en Ciencias Sociales. Se detalla el proceso de especificación de variables no directamente observables a doble nivel: conceptual (identificación y especificación del significado exacto de las variables conceptuales de interés, así como la descripción de los diferentes aspectos del concepto) y operacional (observaciones empíricas (indicadores) que representan las variables conceptuales (latentes) en el mundo real, estableciendo las relaciones y dirección de esas relaciones entre ambas) (Babbie, 2017; Bisbe, Batista-Foguet, & Chenhall, 2007; Edwards & Bagozzi, 2000). Respecto al nivel conceptual, se analizan los principales problemas para la conceptualización de la calidad del resultado, que se pueden sintetizar en falta de acuerdo sobre cuatro puntos: (1) Cuáles son las características que definen calidad del resultado y si éstas representan un único concepto teórico o varias dimensiones; (2) Grado de importancia de dichas características para definir calidad del resultado según el usuario de la información contable; (3) El hecho de si todas las características son realmente diferentes dimensiones de calidad del resultado o meras formas de medir la misma característica; (4) La relación entre algunas características y la calidad del resultado.

A continuación, describimos los tipos de relaciones entre calidad contable y sus dimensiones: reflectivas (la variación de la variable objeto de estudio causa variación de sus indicadores) y formativas (la variación de la variable objeto de estudio es determinada (explicada) por la variación de sus indicadores). Si la relación es de tipo formativo, es necesaria la inclusión de todos los aspectos que definen el concepto teórico ya que la exclusión de alguno de ellos altera el propio significado del concepto teórico objeto de estudio (Bisbe et al., 2007). Para el caso de la relación formativa no es necesaria la inclusión de todos los aspectos reflejo del concepto teórico. La mala elección del tipo de relaciones da como resultado la incorrecta especificación del modelo, obteniéndose conclusiones imprecisas a la luz del análisis de dicho modelo mal especificado (Chang et al., 2016; Jarvis et al., 2003; MacKenzie et al., 2005). Siguiendo la clasificación de Dechow et al. (2010) proponemos establecer una relación formativa para las propiedades del resultado contable, puesto que es la variación de éstas la que determina mayor o menor utilidad de la información contable en el proceso de toma de decisiones. Por el contrario, para la respuesta del inversor o la existencia de otros indicadores de errores en la información contable entendemos más apropiada una relación reflectiva, puesto que ambas son consecuencia del mayor o menor grado de calidad del resultado.

Siguiendo el proceso de conceptualización, explicamos cómo el paso posterior es la estimación del peso de cada dimensión para configurar de forma combinada la medida de calidad del resultado. Esta ponderación dependerá de las correlaciones entre costes y beneficios de cada propiedad para el usuario decisor (DeFond, 2010), que será diferente para cada entorno de toma de decisiones (Dechow et al., 2010). Por último, se completa el proceso estableciendo la descripción de las medidas que representan los conceptos teóricos en el mundo real (Babbie, 2017), es decir, las variables directa o indirectamente observables que sirven como indicadores de los constructos definidos en el plano conceptual. Al respecto, existe una gran variedad de medidas para cada dimensión de la calidad del resultado, si bien éstas han sido muy criticadas en literatura de medir calidad del resultado con error (Christodoulou, Ma, & Vasnev, 2018; Dechow, Sloan, & Sweeney, 1995; Jackson, 2018; Jones, Krishnan, & Melendrez, 2008; McNichols & Stubben, 2018). Un Segundo problema es que en algunos casos, el mismo indicador puede estar asociado a diferentes características. En cuanto a la relación entre las diferentes características y sus indicadores, se argumenta que todos ellos tienen relación reflectiva para todos los casos, puesto que las medidas son reflejo empírico de la realidad teórica que están midiendo.

Considerando lo anterior, revisamos el tipo de enfoque de los modelos empíricos de calidad del resultado en literatura, poniendo de manifiesto los principales problemas que surgen en la estimación de modelos utilizados anteriormente. El enfoque más utilizado, indicador único, supone la asunción de muchas suposiciones para medir calidad del resultado. Se considera implícitamente que la característica medida es la única relevante para la calidad del resultado, o que el resto se mantiene constante para esa decisión específica. Asimismo, no se comprueba la naturaleza reflectiva o reflectiva de la relación ya que sólo hay una característica relevante, que está representada de manera apropiada por un único indicador. Este enfoque da como resultado que las medidas capturan diferentes aspectos del concepto, siendo difícil clarificar si miden el mismo concepto o diferentes conceptos, así como si son sustitutivas o complementarias (Ewert & Wagenhofer, 2011). En cuanto al enfoque multidimensional, se utilizan dos métodos: ranking equiponderado de diferentes propiedades del resultado (generalmente por deciles) y factor común por análisis factorial de diferentes propiedades del resultado. El ranking presenta el problema de que generalmente no se incluyen todas las medidas e, igualmente, no se presenta un análisis formal a nivel teórico de las relaciones esperadas así como de la ponderación de las propiedades incluidas, asumiendo igual ponderación para todas. El factor común asume que los diferentes indicadores son manifestaciones del mismo constructo, es decir, que la relación entre calidad del resultado y sus dimensiones es reflectiva. Por tanto, no consideran calidad del resultado formada por varias dimensiones sino como un único constructo medido con error por sus indicadores. Considerando tales problemas, se concluye que los diferentes enfoques usados en literatura para medir calidad del resultado se sustentan en suposiciones fuertes que no han sido probadas y que comprometen la validez de sus conclusiones.

A continuación proponemos la aplicación de PLS como un método potencialmente más apropiado para medir la calidad del resultado, que además permite comprobar no sólo la relación de calidad del resultado con otras variables sino también la validez de la medición de calidad del resultado a través de sus dimensiones representativas. Al respecto, se detallan los diferentes test que realiza PLS como proceso de validación de escala (Diamantopoulos & Winklhofer, 2001), así como sus reglas de nivel crítico de aceptación. Además, se realiza mediante un proceso de simulación una comparativa entre PLS y las técnicas anteriores (uso de un único indicador, ranking equiponderado de diferentes propiedades y factor común de diferentes propiedades). Los resultados corroboran empíricamente la superioridad de la técnica de PLS sobre las tres usadas anteriormente para medir la calidad del resultado ya que el error cuadrático de estimación es inferior en PLS para los diferentes entornos de información, tanto si el modelo de medición de la calidad del resultado es completo como si es incompleto (problemas de especificación en alguna parte del modelo cuando el investigador no ha identificado todas las propiedades del resultado o no ha usados todos los diferentes indicadores empíricos disponibles para cada propiedad). Por tanto, la estimación de PLS es menos sesgadas que los otros tres métodos, lo que hace que su aplicación en la medición de calidad del resultado resulte en una mejora de su estimación.

CAPÍTULO CUARTO.

El Capítulo 4 ("Discusión de los resultados") presenta los resultados empíricos. Considerando la potencial mejora para estimar la calidad del resultado, este capítulo comienza presentando un diseño de investigación para la medición de la calidad del resultado utilizando un modelo PLS. Después de presentar los principales descriptivos estadísticos para los indicadores incluidos en el modelo, discutimos el proceso de validación de escala con PLS para las principales medidas de las diferentes dimensiones de calidad del resultado en literatura previa (validación del modelo de medida). Para mayor claridad, los resultados se presentan para cada dimensión, analizando la validez de los diferentes indicadores a la hora de representar su concepto teórico. Este test de validez se ha realizado considerando tanto cada indicador individualmente como la agregación de todos los indicadores para la misma dimensión. También comprobamos la validez discriminante de cada dimensión para comprobar si cada dimensión es significativamente diferenciable del resto. Comenzando a nivel de indicador, se eliminan iterativamente aquellos indicadores que no alcanzan el mínimo para ser considerados representación válida del concepto teórico que pretenden medir, y se comprueba si, eliminados éstos, la agregación de indicadores en los diferentes constructos ofrece resultados aceptables a nivel de fiabilidad y validez del constructo. El proceso se repite iterativamente hasta lograr que tanto a nivel individual como a nivel de constructo se alcancen los mínimos de validez de medida.

Los resultados del modelo de validación utilizando PLS ofrecen luz para resolver los principales interrogantes planteados sobre la medición de la calidad del resultado. Con respecto a la variable dependiente (percepción del nivel de calidad del resultado por los inversores en patrimonio neto), probamos que los indicadores que provienen del modelo de estimación de ERC (regresión de rentabilidad sobre resultados), tanto coeficiente como R2, no están suficientemente correlacionados con la representación del nivel de calidad del resultado que perciben los inversores. Asimismo, el indicador del R2 del modelo de relevancia (regresión del precio sobre resultado y valor en libros) tampoco es representativo. En la situación original, esta baja correlación provocaba que la medida agregada de percepción de calidad del resultado no fuese representativa de sus indicadores y que esos indicadores no explicasen suficientemente la calidad del resultado percibida. Una vez eliminados esos tres indicadores, los restantes sí ofrecen validez de medida tanto a nivel individual como agregado. A nivel de persistencia del resultado, no hay evidencia de problemas de medición para la mayoría de sus indicadores. Sólo dos indicadores (varianza del resultado y coeficiente de la regresión de flujo de caja actual sobre flujo de caja futuro) son eliminados, siendo los otros cinco indicadores apropiados para representar válidamente la persistencia tanto a nivel individual como agregado. De manera similar a la situación de la persistencia, para la validez de la medición de calidad de ajustes por devengo encontramos los mejores resultados de validez. De hecho, sólo dos de los doce indicadores del constructo son eliminados (modelos de Kang y Sivaramakrishnan (1995) y de Ball y Shivakumar (2006)), ofreciendo el resto resultados apropiados de validez de medida tanto a nivel individual como agregado. Para el alisamiento de resultados, sus dos indicadores muestran niveles aceptables de validez tanto a nivel individual como agregado. Por último, respecto al conservadurismo, es la variable con mayores problemas a nivel de validez de medida para representar empíricamente el concepto. Así, todos los indicadores a excepción del grado de asimetría del resultado ofrecen niveles no aceptables de validez de medida, indicando de esta forma que las medidas de conservadurismo no están representando el mismo concepto. Esto confirma la baja correlación entre medidas de conservadurismo en estudios de literatura previa (Givoly et al., 2007; Ryan, 2006; Wang et al., 2009), que señalan que esas medidas sólo se centran en aspectos concretos de conservadurismo, sin dar una medida precisa del nivel general de conservadurismo (Givoly et al., 2007). Estos resultados están en línea con los trabajos que evidencian contradicciones entre los diferentes aspectos reflejados por las medidas de conservadurismo (Ball et al., 2000; Beaver & Ryan, 2005; Giner & Rees, 2001; Givoly et al., 2007; Roychowdhury & Watts, 2007; Wang et al., 2009). Concluimos por tanto que en base a la evidencia empírica no se puede considerar un concepto teórico de conservadurismo único que sea medido con diferentes medidas sino simplemente diferentes aspectos que denotan la aplicación de criterios conservadores en el reconocimiento contable.

Tras comprobar la validez del modelo de medida, argumentamos sobre la validez del modelo estructural, comparando el poder de predicción y el sesgo de estimación de la estimación por PLS con la del resto de modelos de calidad del resultado. Considerando en conjunto los resultados de R2 (poder de predicción de la muestra) y Q2 (poder de predicción para extrapolar resultados fuera de la muestra) de los determinantes de calidad del resultado para explicar el nivel de calidad percibida, podemos concluir que ambos son bajos. Sin embargo, a pesar de ese bajo nivel de predicción, la propiedad de la persistencia muestra un poder de explicación considerablemente mayor para explicar las percepciones del grado de calidad del resultado percibida por los inversores en neto patrimonial. Este resultado está en línea con estudios previos de literatura donde se pregunta a usuarios de la información financiera por la cualidad que más valoran en la misma, siendo persistencia la más valorada (Tucker & Zarowin, 2006). A pesar de su mayor poder de predicción, resulta sorprendente que sea la propiedad menos usada como representativa de la calidad del resultado en contraste con otras muy utilizadas comúnmente, como son la calidad de ajustes por devengo o el conservadurismo.

De igual forma, analizamos si tiene sentido considerar un concepto general y abstracto de calidad del resultado o, por el contrario, hay simplemente una serie de dimensiones representativas del mismo. Los resultados demuestran que realmente existe un concepto de calidad del resultado contable y no meramente diferentes propiedades del resultado indicativas del mismo. Finalmente, analizamos la importancia de cada dimensión para explicar las consecuencias de la calidad del resultado (Importance-Performance Map –IPMA– Analysis) El análisis de IPMA señala potencial de mejora en la medición de conservadurismo y persistencia del resultado y lleva a reconsiderar la excesiva preponderancia de calidad de los ajustes por devengo como medida explicativa de calidad del resultado contable.

CAPÍTULO QUINTO.

La presente tesis doctoral termina con el Capítulo 5 ("Conclusiones"), donde presentamos las principales conclusiones, las limitaciones de este estudio, así como las futuras líneas de investigación que pueden desarrollarse a raíz de este trabajo. En el apartado siguiente de este resumen en castellano se detallan dichas conclusiones.

CONCLUSIONES

De acuerdo a los objetivos para la presente investigación de tesis doctoral y a la luz de los varios análisis teóricos y empíricos desarrollados en los diferentes capítulos antes resumidos, podemos concluir lo siguiente:

1-) La revisión del estado de la cuestión revela que la calidad contable es quizá el tema de estudio más recurrente en la investigación empírica en contabilidad (aproximadamente un 10% sobre el número total de trabajos). Este amplio cuerpo de investigación garantiza la necesidad de desarrollar medidas empíricas apropiadas para este concepto que permitan la extracción de conclusiones válidas acerca de sus causas o consecuencias. En este sentido, es de resaltar el escaso número de estudios que analizan la validez de la medición de la calidad del resultado contable.

2-) El análisis de la conceptualización de la calidad contable a nivel conceptual lleva a concluir que no es posible encontrar un concepto claro, explícito y único de la calidad del resultado ni por parte de los reguladores contables ni en la literatura existente. De lo que se habla en literatura contable es, en el mejor de los casos, sobre diferentes dimensiones que son representativas de la calidad del resultado (Perotti & Wagenhofer, 2014). A pesar de ello no está claro qué o cuántas dimensiones son, ni su relación con la calidad del resultado.

3-) A nivel operacional, un problema importante de la calidad del resultado es que es un concepto no directamente observable. La literatura previa ha desarrollado un extenso abanico de medidas empíricas heterogéneas, las cuales se asumen como representativas de las diferentes dimensiones que son indicativas de la calidad del resultado en términos de una mayor utilidad de la información contable (Dechow et al., 2010; Ewert & Wagenhofer, 2011, 2015; Perotti & Wagenhofer, 2014). Tal heterogeneidad, sin embargo, dificulta la identificación de si esas medidas son realmente representativas del mismo concepto, diferentes facetas de un único concepto, o incluso diferentes conceptos (Ewert & Wagenhofer, 2011). Además, no existe prueba que evidencia que alguna de ellas represente de manera completa la calidad del resultado ni sea superior al resto de medidas (Dechow et al., 2010). Adicionalmente, al investigación sobre la relación entre esas medidas y el concepto de calidad contable (esto es, si están relacionadas de manera formativa o reflectiva) no ha sido explorado en la literatura previa. Es más, la escasa investigación sobre la validez de las medidas de calidad del resultado evidencia la existencia de problemas estadísticos para todas las medidas (Leuz & Wysocki, 2016). Por tanto, ninguna de esas medidas está representando apropiadamente de manera completa el concepto teórico que mide. Más aún, los estudios previos señalan que las diferentes medidas de calidad del resultado ofrecen resultados contradictorios incluso si miden la misma dimensión de la calidad del resultado (Ewert & Wagenhofer, 2011), cuestionando por tanto la consistencia de las dimensiones que son explicadas por dichas medidas. Considerando todo lo anterior, existe una necesidad de analizar la validez de las diferentes medidas para las dimensiones de la calidad del resultado, determinando cuál es el concepto que está siendo medido, y si dichas medidas están midiéndolo correctamente, así como la relación que existe entre las diferentes medidas y la calidad del resultado.

A este respecto, hay técnicas estadísticas como los Modelos de Ecuaciones Estructurales (en particular, la técnica de Mínimos Cuadrados Parciales (Partial Least Squares, PLS)) que están siendo aplicados en otros campos de investigación: psicología, dirección estratégica, sistemas de información para los directivos o marketing (Hair et al., 2013; Lee et al., 2011; Sarstedt et al., 2014), así como en contabilidad de gestión o contabilidad conductual (Hampton, 2015; Lee et al., 2011) y que tratan la medición de variables que no son directamente observables.

4-) A pesar de la naturaleza multidimensional de la calidad del resultado, existe un gap en el análisis empírico en la literatura previa como refleja una amplia mayoría de estudios que adopta un enfoque de corte unidimensional para la medición de la calidad del resultado (más de un 80% del total de estudios de calidad del resultado). Estos modelos sufren de incorrecta especificación y sesgo de estimación por no considerar el resto de dimensiones de calidad de resultado que son explicativas del concepto. Más aún, el escaso número de trabajos que adoptan una medida multidimensional (sólo un 3%, aproximadamente, del total de estudios de calidad del resultado) no incluyen todas las dimensiones (o, en el mejor de los casos, lo hacen sin dar una explicación teórica), con igual ponderación para todas ellas (o sin justificar dicha ponderación) y sin un control de las correlaciones entre dichas dimensiones.

5-) Los principales métodos que se han usado tradicionalmente para estimar la calidad del resultado presentan una serie de problemas. En primer lugar, los estudios de una única dimensión consideran que sólo una de las dimensiones es representativa para explicar la calidad del resultado, sin considerar el resto de dimensiones explicativas de la calidad del resultado. Además, dichos modelos asumen (sin prueba empírica alguna sobre ello) que las medidas que se usan para medir esa característica considerada como relevante están midiendo realmente esa característica y no otra diferente. En segundo lugar, las dos técnicas de corte multidimensional adoptadas en la literatura previa (ranking equiponderado y factor común) también muestran problemas de estimación. El ranking equiponderado asume que las características de la calidad del resultado que se incluyen en el índica son las únicas relevantes y que todas ellas tienen la misma importancia para explicar la calidad del resultado. Asumen también que esas características están medidas correctamente por sus medidas empíricas. Con respecto al factor común, esta técnica asume (sin prueba empírica de ello) que no hay características de la calidad del resultado diferentes a las incluidas en el modelo y que dichas características están midiendo realmente la calidad del resultado.

6-) Por las razones expuestas con anterioridad, pensamos que es necesario evaluar y asegurar la consistencia interna de la estimación de las diferentes dimensiones de calidad del resultado que son estimadas con las diferentes medidas empíricas que representan la misma dimensión. El método de PLS puede servir de ayuda para ese propósito ya que, mediante un proceso sistemático en dos fases, analiza en primer lugar la validez y consistencia interna de los conceptos que están siendo representados por las medias empíricas y, sólo tras asegurar la validez y consistencia en el nivel operacional, comprueba la representatividad de las relaciones entre las diferentes variables (Fornell & Larcker, 1981; Hair et al., 2011; Hair, Tomas, et al., 2016; Henseler et al., 2012; Roldán & Sánchez-Franco, 2012; Ullman, 2006).

7-) De manera adicional, mediante un estudio de simulación en el cual compramos los errores de estimación de las tres principales técnicas en la medición de la calidad del resultado en literatura previa (indicador único, índice equiponderado y factor común) con los de la técnica de PLS, demostramos que el PLS ofrece estimaciones para la medición de la calidad del resultado contable que son menos sesgadas (con menores errores de estimación) que los modelos previos incluso en ambientes de información limitada, esto es, si alguna de las dimensiones o indicadores para alguna dimensión de la calidad del resultado contable no han sido identificados. En consecuencia, se espera una mejora de la medición de la calidad del resultado contable con la aplicación de la técnica de PLS.

8-) Considerando todo lo anterior, proponemos un estudio empírico para estimar la calidad del resultado contable a través de la técnica del PLS. Esta técnica nos permite validar empíricamente la validez de la medición de las diferentes dimensiones de la calidad del resultado. Nuestro modelo considera que la calidad del resultado se mide de manera formativa por las propiedades de la información contable que son indicativas de la calidad del resultado (persistencia, calidad de los ajustes por devengo, alisamiento del resultado y conservadurismo (véase por ejemplo Dechow et al., 2010; Ewert & Wagenhofer, 2011, 2015; Francis et al., 2004; Perotti & Wagenhofer, 2014; Schipper &

Vincent, 2003) y de manera reflectiva por la calidad del resultado contable que es percibida por los inversores en patrimonio neto (Dechow et al., 2010). Además, la calidad del resultado podría ser medida de manera reflectiva por otros indicadores tales como las rectificaciones tras las opiniones de auditoría (Dechow et al., 2010).

9-) El análisis del modelo de calidad del resultado testado empíricamente mediante la técnica de PLS ofrece los siguientes resultados:

-Varias de las medidas que han sido usadas en literatura previa para representar las propiedades de la calidad del resultado no parecen medir correctamente el concepto al que representa. En particular, resulta notoria la falta de validez de las medidas empíricas del grado de conservadurismo.

-La influencia de las propiedades del resultado para explicar el grado de calidad contable percibida por los inversores en neto patrimonial es estadísticamente significativa, si bien presenta un bajo poder de predicción, tanto en la muestra como para inferencias fuera de la muestra.

-A pesar del bajo poder predictivo general para todas las propiedades, la persistencia muestra un poder de estimación considerablemente mayor en comparación con el resto de propiedades de la información contable. A pesar de ello, la persistencia ha sido usada en literatura como dimensión representativa de la calidad del resultado en mucho menor grado en los estudios empíricos previos. Por ende, los estudios futuros podrían considerar la posibilidad de incluir de manera más frecuente la persistencia en los modelos de calidad del resultado.

-La calidad de los ajustes por devengo, que es la propiedad del resultado mejor medida por sus indicadores, como evidencian los diferentes test de validez en el análisis del PLS es, sin embargo, la propiedad menos importante para explicar el nivel de calidad contable que es percibido por los inversores en patrimonio neto. En consideración, pensamos que los estudios futuros de calidad del resultado podrían usar la calidad de ajustes por devengo como dimensión representativa de la calidad del resultado, si bien corrigiendo por su menor importancia para explicar el nivel de calidad percibida por los inversores de patrimonio neto.

10-) Para concluir, animamos a los investigadores a adoptar en futuros trabajos de investigación este tipo de métodos, dado que aseguran la validez de medica apropiada de las variables, teniendo en cuenta también su importancia para explicar la variable dependiente en términos de poder de predicción De esta forma, la estimación de la calidad del resultado sería más precisa y con mayor poder de predicción Por ende, las conclusiones extraídas del análisis serían potencialmente más representativas de los efectos reales de la calidad del resultado contable sobre la variable objeto de estudio.

REFERENCIAS DEL RESUMEN EN ESPAÑOL

Babbie, E. (2017). *The basics of social research (7th ed.)*. (Cengage, Ed.) (7th ed.). Boston, United States, Boston: Wadsworth Publishing.

Ball, R., & Shivakumar, L. (2006). The Role of Accruals in Asymmetrically Timely Gain and Loss Recognition. *Journal of Accounting Research*, *44*(2), 243–255.

Bisbe, J., Batista-Foguet, J.-M., & Chenhall, R. (2007). Defining management accounting constructs: A methodological note on the risks of conceptual misspecification. *Accounting, Organizations and Society*, *32*(7–8), 789–820.

Chang, W., Franke, G. R., & Lee, N. (2016). Comparing reflective and formative measures: New insights from relevant simulations. *Journal of Business Research*, *69*(8), 3177–3185.

Christodoulou, D., Ma, L., & Vasnev, A. (2018). Inference-in-residuals as an Estimation Method for Earnings Management. *Abacus*, *54*(2), 154–180.

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting & Economics*, *50*(2/3), 344–401.

Dechow, P., & Schrand, C. (2004). Earnings quality. *The Research Foundation of CFA Institute*.

Dechow, P., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review*, *70*(2), 193–225.

DeFond, M. L. (2010). Earnings quality research: Advances, challenges and future research. *Journal of Accounting and Economics*, *50*(2–3), 402–409. https://doi.org/10.1016/J.JACCECO.2010.10.004

Demerjian, P., Lewis, M., Lev, B., & McVay, S. (2013). Managerial ability and earnings quality. *The Accounting Review*, *88*(2), 463–498.

Diamantopoulos, A., & Winklhofer, H. M. (2001). Index Construction with Formative Indicators: An Alternative to Scale Development. *Journal of Marketing Research*, *38*(2), 269–277.

Edwards, J. R., & Bagozzi, R. P. (2000). On the nature and direction of relationships between constructs and measures. *Psychological Methods*, *5*(2), 155–74.

Ewert, R., & Wagenhofer, A. (2011). *Earnings quality metrics and what they measure* (Working Paper). University of Graz.

Ewert, R., & Wagenhofer, A. (2015). Economic Relations among Earnings Quality Measures. *Abacus*, *51*(3), 311–355.

Fields, T. D., Lys, T. Z., & Vincent, L. (2001). Empirical research on accounting choice. *Journal of Accounting & Economics*, *31*(1–3), 255–307.

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(1), 39–50.

Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2004). Costs of Equity and Earnings Attributes. *The Accounting Review*, *79*(4), 967–1010.

Francis, J., & Schipper, K. (1999). Have financial statements lost their relevance?

Journal of Accounting Research, *37*(2), 319–352.

Gefen, D., Rigdon, E. E., & Straub, D. W. (2011). An Update and Extension to SEM Guidelines for Administrative and Social Science Research. *MIS Quarterly*, *35*(2), iii-A7.

Gefen, D., Straub, D. W., & Boudreau, M.-C. (2000). Structural Equation Modeling and Regression: Guidelines for Research Practice. *Communications of the Association for Information Systems*, *4*(1), 7.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *The Journal of Marketing Theory and Practice*, *19*(2), 139–152.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. *Long Range Planning*, *46*(1–2), 1–12.

Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012). The Use of Partial Least Squares Structural Equation Modeling in Strategic Management Research: A Review of Past Practices and Recommendations for Future Applications. *Long Range Planning*, *45*(5–6), 320–340.

Hair, J. F., Tomas, G., Hult, M., Ringle, C. M., & Sarstedt, M. (2016). *A primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (2nd ed.). Thousand Oaks, CA: Sage.

Hampton, C. (2015). Estimating and Reporting Structural Equation MOdels with Behavioral Accounting Data. *Behavioral Research in Accounting*, *27*(2), 1–34.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2012). Using partial least squares path modeling in advertising research: basic concepts and recent issues. In S. Okazaki (Ed.), *Handbook of Research on International Advertising* (pp. 252–276). Cheltenham, UK: Edward Elgar.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares structural equation modeling in marketing research. *Advances in International*

Marketing, *20*, 277–320.

Henseler, J., & Sarstedt, M. (2013). Goodness-of-fit indices for partial least squares path modeling. *Computational Statistics*, *28*(2), 565–580.

Jackson, A. B. (2018). Discretionary Accruals: Earnings Management ... or Not? *Abacus*, *54*(2), 136–153.

Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research*, *30*(2), 199–218.

Jones, K. L., Krishnan, G. V, & Melendrez, K. D. (2008). Do Models of Discretionary Accruals Detect Actual Cases of Fraudulent and Restated Earnings? An Empirical Analysis. *Contemporary Accounting Research*, *25*(2), 6.

Kang, S.-H., & Sivaramakrishnan, K. (1995). Issues in testing earnings management and an instrumental variable approach. *Journal of Accounting Research*, *33*(2), 353–367.

Lee, L., Petter, S., Fayard, D., & Robinson, S. (2011). On the use of partial least squares path modeling in accounting research. *International Journal of Accounting Information Systems*, *12*(4), 305–328.

Leuz, C., & Wysocki, P. D. (2016). The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research. *Journal of Accounting Research*, *54*(2), 525–622.

MacKenzie, S. B., Podsakoff, P. M., & Jarvis, C. B. (2005). The problem of measurement model misspecification in behavioral and organizational research and some recommended solutions. *Journal of Applied Psychology*, *90*(4), 710–730.

McNichols, M. F., & Stubben, S. R. (2018). Research Design Issues in Studies Using Discretionary Accruals. *Abacus*, *54*(2), 227–246.

Nitzl, C. (2016). The use of partial least squares structural equation modelling (PLS-

SEM) in management accounting research: Directions for future theory development. *Journal of Accounting Literature*, *37*, 19–35.

Perotti, P., & Wagenhofer, A. (2014). Earnings quality measures and excess returns. *Journal of Business Finance & Accounting*, *41*(5–6), 545–571.

Roldán, J. L., & Sánchez-Franco, M. J. (2012). Variance-based structural equation modeling: Guideliness for using partial least squares in information systems research. In M. Mora, O. Gelman, A. Steenkamp, & M. S. Raisinghani (Eds.), *Research Methodologies, Innovations and Philosophies in Software Systems Engineering and Information Systems* (pp. 193–211). Hershey, PA: IGI Global.

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2014). PLS-SEM: Looking Back and Moving Forward. *Long Range Planning*, *47*(3), 132–137.

Schipper, K., & Vincent, L. (2003). Earnings quality. *Accounting Horizons*, *17*, 97–110.

Smith, D., & Langfield-Smith, K. (2004). Structural Equation Modeling in Management Accounting Research: Critical Analysis and Opportunities. *Journal of Accounting Literature*, *23*, 49–86.

Ullman, J. B. (2006). Structural Equation Modeling : Reviewing the Basics and Moving Forward. *Journal of Personality Assessment*, *87*(1), 35–50.