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**COMMERCE SUD-SUD ET “NOUVELLE”  
GÉOGRAPHIE DU COMMERCE INTERNATIONAL : LE  
RÔLE DES ÉCONOMIES EMERGENTES**

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*A mémé et à Fabienne*

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# Introduction générale

“Aujourd’hui, 40 ans après la création de la CNUCED, il est facile de constater l’émergence d’une nouvelle géographie commerciale, dans laquelle le Sud s’éloigne progressivement de la périphérie de l’économie et du commerce mondiaux, ce qui traduit une évolution du schéma traditionnel de la division internationale du travail” (CNUCED, 2004). Effectivement, la dynamique du commerce Sud-Sud<sup>1</sup>, tirée en grande partie par les pays asiatiques, continue d’être le principal moteur de la croissance du commerce mondial depuis les années 1990 face à la stagnation des échanges Nord-Sud et à la diminution des échanges Nord-Nord. Qui plus est, une sensible modification de la structure des échanges des pays en développement (PED) s’est manifestée en s’alignant sur des produits des pays du Nord avec des qualités différentes (Chaponnière et Lautier, 2012). C’est en ce sens d’ailleurs que les PED viennent concurrencer de plus en plus les pays développés, en particulier sur les marchés des économies en développement consolidant ainsi les relations Sud-Sud.

C’est notamment le cas dans les relations commerciales. “Il y a 20 ans, le commerce Sud-Sud représentait environ 10% du commerce mondial, aujourd’hui ce chiffre est de 30%”<sup>2</sup>. La vigueur du commerce Sud-Sud s’est particulièrement illustrée du-

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<sup>1</sup>Sur la période 1995-2014, le commerce Sud-Sud affiche un taux de croissance de 12,6%, contre 7,7% pour le commerce mondial.

<sup>2</sup>[https://www.wto.org/english/tratop\\_e/devel\\_e/a4t\\_e/global\\_review15prog\\_e/sessions10\\_e.htm](https://www.wto.org/english/tratop_e/devel_e/a4t_e/global_review15prog_e/sessions10_e.htm)

rant la crise de 2008-2009 grâce à sa résilience, contrairement aux pays développés, grâce à la régionalisation de leurs échanges commerciaux et à une moindre intégration dans la finance internationale. L'origine de ce mouvement de fond découle d'un ensemble de facteurs interdépendants qui a conduit à ce basculement. D'une part, selon les Perspectives de l'économie mondiale du FMI en 2016, les économies en développement représentent plus de 70% de la croissance mondiale, principalement issue des pays asiatiques. D'autre part, la coopération Sud-Sud demeure un levier de développement incontournable pour ces économies en exploitant les potentiels qui existent en termes de ressources humaines, d'économies d'échelle et de matières premières. A titre d'exemple, plus de la moitié de la coopération bilatérale de la Chine était destinée à l'Afrique, en particulier dans les secteurs liés à l'infrastructure économique et sociale. Pour autant, l'hétérogénéité<sup>3</sup> au sein même des PED tend à nuancer les effets escomptés à cause de la concentration des échanges autour d'un groupe d'économies émergentes et surtout de la Chine.

“Les marchés émergents représentaient 60% de la croissance mondiale entre 2010-2014 et constituaient 34% du PIB mondial (en prix courants) en 2014. De plus, les relations économiques entre les économies émergentes, et spécialement avec les BRICs, ont significativement augmenté depuis 2000. Par exemple, 30% des exportations des pays émergents provenaient des autres pays en développement en 2014 (contre tout juste 12% en 1990)”<sup>4</sup>. Un groupe de pays émergents attire particulièrement l'attention depuis quelques années, à savoir les BRICs composés du Brésil, de la Russie, de l'Inde et de la Chine (O'Neill, 2001). Effectivement, la part des BRICs dans le PIB mondial s'avère être supérieur à celle de l'ensemble des autres économies

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<sup>3</sup>La présence de disparités entre, d'un côté, les pays les moins avancés (PMA), les nouveaux pays industrialisés (NPI), et de l'autre, le reste des PED.

<sup>4</sup><http://www.voxeu.org/article/painful-spillovers-slowing-brics-growth>.

émergentes, respectivement 26% et 24% en 2012. De plus, “premier exportateur mondial, la Chine est de loin le premier exportateur vers le Sud. [...] Hors Asie, les principaux exportateurs Sud-Sud sont les fournisseurs de matières premières et les puissances industrielles régionales comme le Brésil ou la Turquie” (Chaponnière et Lautier, 2012). Une relation d’interdépendance se dégage nettement entre les BRICs aussi bien avec les pays avancés qu’avec les PED. D’un côté, il apparaît que les BRICs dépendent davantage des économies développées que l’inverse. A titre d’exemple, 46% des exportations totales des BRICs en 2011 proviennent de la Triade<sup>5</sup> alors que celles de la Triade se concentrent en très grande partie au niveau régional. D’un autre côté, ce sont les PED qui sont les plus exposés aux fluctuations économiques des BRICs. C’est le cas des pays exportateurs de produits primaires qui ont pleinement tiré profit de la croissance de la demande chinoise.

La Chine admet ainsi un poids plus conséquent dans les PIB et les échanges mondiaux par rapport aux trois autres BRICs réunis, respectivement 14,9%, 11,5% contre 11,4% et 6% en 2011. Par ailleurs, le tournant économique opéré par les autorités chinoises à partir de 1978<sup>6</sup> a permis l’internationalisation progressive de l’économie chinoise. C’est en particulier pour cette raison que le taux de croissance des échanges commerciaux était presque deux fois supérieurs à la croissance de la richesse nationale à l’époque (Lemoine, 1995). Ce géant démographique est devenu au fil des années un acteur central dans la division internationale du travail. Pour ce faire, elle a conservé sa spécialisation traditionnelle tout en développant de nouveaux secteurs tournés vers l’extérieur grâce aux transferts technologiques. “L’offre

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<sup>5</sup>Etats-Unis, Japon, Union européenne (UE).

<sup>6</sup>Par l’adoption d’une économie socialiste de marché accompagnée d’une nouvelle forme de mercantilisme. Ce dernier repose essentiellement sur quatre piliers : un faible coût de la main d’oeuvre, un capitalisme totalitaire avec les grandes entreprises d’Etat, des zones économiques spéciales et une dévaluation compétitive du yuan.

chinoise de produits manufacturés à bas prix a exercé une pression à la baisse sur les prix mondiaux de ces produits” (Lemoine et Ünal-Kesenci, 2007). Dans le même temps, l’augmentation de la demande chinoise en matières premières a largement bouleversé l’économie des pays exportateurs de produits primaires, essentiellement les pays africains.

En effet, l’Afrique, malgré la concentration des PMA sur le continent, est loin d’avoir été épargnée par ce basculement de l’économie mondiale après avoir été longtemps marginalisée. “Avant la crise économique, la part du commerce de l’Afrique avec les autres marchés émergents était aux alentours de 30%. Aujourd’hui, on se rapproche des 50%, et d’ici 2020, la tendance semble avoisiner les 70%”<sup>7</sup>. L’Afrique est ainsi devenue un terrain d’action privilégié par les économies émergentes<sup>8</sup>, ce à quoi cette thèse aspire à étudier ici. La Chine tient d’ailleurs une place particulière en devenant son premier partenaire commercial en 2009. “Les deux régions occupent dans les échanges des deux partenaires une place plus importante que dans l’ensemble du commerce mondial” en dix ans seulement (Chevallier, 2012). Par conséquent, les relations sino-africaines constituent sans nul doute un des traits saillants de cette “nouvelle” géographie du commerce international par la présence d’une complémentarité presque naturelle entre elles (Chevallier, 2012). D’un côté, la Chine peut s’appuyer sur son développement industriel, ses besoins en ressources naturelles, sa recherche de débouchés à l’étranger, sa volonté de diversifier et de sécuriser ses approvisionnements pour renforcer sa présence dans cette région. D’un autre côté, l’Afrique semble n’être toujours pas sortie indemne de la décolonisation

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<sup>7</sup><http://www.uneca.org/fr/stories/africa-will-be-trading-predominantly-partners-south-2020>.

<sup>8</sup>Cela s’illustre notamment par la tenue de sommets officiels pour les pays africains : la FOCAC depuis 2000, Afrique-Amérique latine depuis 2006, Inde-Afrique et Afrique-Turquie depuis 2008.

qui a laissé encore des traces sur le modèle politico-économique africain<sup>9</sup>.

Dans ce contexte, **cette thèse se propose d'étudier certains aspects de la relation entre le commerce Sud-Sud et la "nouvelle" géographie du commerce international**. Dans un premier temps, l'on examine trois caractéristiques relatives à la mutation des relations Sud-Sud : déterminants du commerce Sud-Sud, diversification géographique du commerce et réorientation des échanges. Dans un second temps, l'on s'intéresse au lien entre commerce Sud-Sud et politique économique extérieure<sup>10</sup> par deux analyses distinctes : diplomatie économique et accords commerciaux régionaux. Nous illustrerons notre démarche empirique en apportant une attention toute particulière aux liens qui existent entre les BRICs et l'ASS puis entre la Chine et l'ASS. Avant d'approfondir les apports de cette thèse, il est nécessaire de présenter ces spécificités relatives à la relation entre le commerce Sud-Sud et la "nouvelle" géographie du commerce international.

La première d'entre elles réside dans l'étude des déterminants des flux commerciaux bilatéraux qui intéresse depuis longtemps les économistes. Un certain nombre d'explications est venu contribuer à la compréhension de l'essor des relations commerciales Sud-Sud avec le rôle prépondérant des pays émergents. En effet, Jenkins et Edwards (2006) s'intéressent aux répercussions économiques (commerce et IDE) qu'ont la Chine et l'Inde sur les pays d'ASS. Au niveau des échanges commerciaux, ils montrent que deux types d'effets apparaissent. D'un côté, une complémentarité avec une amélioration des termes de l'échange africains grâce à la croissance de la demande en matières premières entretenue par ces économies asiatiques. D'un autre côté, la présence d'une compétitivité accrue sur les marchés extérieurs, notamment

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<sup>9</sup>Celui-ci se caractérise par une relative instabilité institutionnelle endémique et une concentration de la structure économique dans les produits primaires.

<sup>10</sup>Elle comprend les mesures favorisant les relations économiques avec l'étranger et protégeant les intérêts des exportateurs nationaux dans le monde (Perroulaz, 2003).

à cause d'une spécialisation de la Chine dans les produits manufacturés à bas coûts vers les marchés africains<sup>11</sup> (Villoria, 2012). De plus, Gu (2008) souligne que la Chine est devenue un acteur décisif, surtout depuis son adhésion à l'OMC en 2001, dans l'accès stratégique aux ressources naturelles (Jenkins et *al.*, 2008; Jenkins, 2012). Néanmoins, la plupart des travaux empiriques semblent n'avoir pas pris en compte l'éventuelle hétérogénéité de ces puissances émergentes dans les échanges du fait de la disparité des engagements et opportunités commerciaux avec les PED (Gu et *al.*, 2016; Scoones et *al.*, 2016).

C'est pourquoi des travaux récents se sont penchés sur ces opportunités en soutenant l'idée selon laquelle le commerce Sud-Sud est un déterminant majeur dans la diversification des échanges des PED. Regolo (2013), Amighini et Sanfilippo (2014) montrent que le commerce entre les pays du Sud s'avèrent être plus bénéfiques pour eux en termes de diversification des exportations par rapport au commerce Nord-Sud. On l'observe surtout pour les produits exportés (en variété et en qualité) grâce à une relative similarité économique (niveau technologique, dotations factorielles, niveau de développement). En outre, He (2013) trouve un impact significativement positif des importations chinoises en provenance de l'Afrique sur les exportations africaines au niveau sectoriel. Une meilleure capacité d'absorption de ces importations dans le processus de production des exportateurs est présente en raison d'un moindre coût et écart technologique comparé aux pays développés. Qu'en est-il alors au niveau de la diversification des partenaires commerciaux ? Cette diversification géographique des exportations a l'avantage de favoriser une structure de production plus diversifiée, de minimiser les chocs extérieurs, d'assurer les flux de revenus et d'accroître les retombées économiques en accédant à de nouveaux marchés (Shepherd, 2010). Dans

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<sup>11</sup>Celle-ci peut être défavorable aux producteurs locaux (Kaplinsky et Morris, 2008) mais aussi aux autres exportateurs dans ce secteur.

ce contexte de croissance du commerce Sud-Sud, aucun travail empirique n'a pour le moment validé cette réorientation manifeste des échanges des PED vers la Chine.

Dans le même temps, la dégradation du commerce entre les ex-colonies et leurs anciens colonisateurs est sans conteste l'une des principales caractéristiques des relations commerciales post-indépendance (De Sousa et Lochard, 2012). Celle-ci vient ainsi mettre fin à l'hégémonie séculaire des puissances coloniales (Mitchener et Weidmeyer, 2008). Deux papiers ont principalement mis en évidence empiriquement l'existence d'une érosion des flux commerciaux depuis l'indépendance entre les ex-colonies et les pays colonisateurs. Head et *al.* (2010) trouvent que l'indépendance a réduit les flux commerciaux des anciennes colonies avec leurs colonisateurs en moyenne de 60% et cet effet tend à augmenter lorsque l'indépendance a été obtenue de manière conflictuelle. Lavallée et Lochard (2015) montrent que les résultats diffèrent selon l'origine des empires coloniaux (France et Grande-Bretagne) au niveau des échanges commerciaux depuis l'indépendance. Ces études empiriques divergent quant à l'existence éventuelle d'une réorientation du commerce des anciennes colonies vers le reste du monde (RDM) à la suite de l'indépendance. Pour autant, le basculement de la richesse mondiale au profit de l'Asie mais surtout de la Chine a conduit à un renforcement particulier des liens commerciaux entre la Chine et les PED. Toutefois, ce regain d'intérêt des autorités chinoises pour les économies du Sud ne doit pas dissimuler les visées hautement stratégiques de la République populaire de Chine (RPC) pour assurer avant tout ses intérêts sur la scène internationale.

Contrairement à la perception traditionnelle selon laquelle la Chine serait intéressée uniquement par les ressources naturelles de l'Afrique, les intérêts chinois se concentrent autour de quatre dimensions : politique, économique, sécuritaire et idéologique (Sun, 2014). Le concept de diplomatie économique rassemble ces derniers dans la mesure où celle-ci se définit comme l'utilisation d'instruments de la politique

étrangère, ici la diplomatie, pour atteindre des objectifs économiques (Bergeijk et *al.*, 2011). L'usage par la Chine de sa puissance économique afin d'asseoir ses positions sur ses partenaires commerciaux est l'un des principaux aspects des relations Sud-Sud. En effet, le cas du Tibet mais aussi celui de Taiwan, dont nous traiterons ici, sont de parfaites illustrations. Ainsi, Fuchs et Klann (2013) s'intéressent à l'impact des visites du Dalai-Lama sur les flux commerciaux des pays hôtes avec la Chine. Il s'avère que celles-ci entraînent une détérioration temporaire des échanges avec la Chine compte tenu de la prohibition de toute relation avec le Tibet. Pour ce faire, celle-ci recourt à des représailles tant politiques qu'économiques en faisant pression. D'autres études ont aussi démontré l'importance de la diplomatie économique dans le commerce par le biais des visites d'Etat (Nitsch, 2007) et des représentations diplomatiques (Rose, 2007; Yakop et Bergeijk, 2011) participant à la facilitation du commerce. Même si la diplomatie économique tient une place singulière dans la politique économique extérieure des Etats, l'intégration régionale reste un maillon essentiel dans l'insertion économique des pays.

Les accords préférentiels (AP)<sup>12</sup> Sud-Sud ont largement contribué à l'expansion des accords régionaux<sup>13</sup> ces dernières années. Ils ont d'ailleurs suscité du scepticisme de la part des observateurs et chercheurs au sujet de leur efficacité. Effectivement, Venables (2003) suggère que ces types d'accords sont inefficaces en termes de convergence économique à cause notamment d'une complémentarité insuffisante entre

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<sup>12</sup>Typologie de Balassa (1961) : zones d'échange préférentiel (réduction ou suppression des barrières commerciales pour certains secteurs), zones de libre-échange (suppression des barrières commerciales entre les pays membres mais maintien vis-à-vis de l'extérieur individuellement), unions douanières (application d'un tarif extérieur commun envers les pays tiers et politique commerciale commune), marché commun (libre circulation des facteurs de production), union économique et monétaire (politique monétaire commune et adoption d'une monnaie unique) et union politique (autorité supranationale se substituant aux autorités nationales dans la plupart des domaines).

<sup>13</sup>Près des 2/3 des AP sont conclus entre PED contre 1/4 entre les pays développés et les pays du Sud selon l'OMC.

les PED. Pour Medvedev (2010), Behar et Cirera-i-Crivillé (2013), Cheong et *al.* (2015), au contraire, les accords Nord-Nord n'ont aucun effet sur le commerce intra-zone alors que les accords Sud-Sud ont un effet positif plus important sur les flux commerciaux que les accords Nord-Sud. Pour Vicard (2011), quel que soit le niveau de développement des partenaires, ces AP ont le même impact sur les échanges commerciaux. Dans le cas des AP africains, les résultats ont été d'abord mitigés, essentiellement à cause du retard dans leur mise en oeuvre et par des blocages internes de la part des autorités (Foroutan et Pritchett, 1993 ; Gunning, 2001). Alors même que les AP diffèrent complètement, force est de constater que peu de papiers les distinguent selon leur forme et leur origine géographique. Carrère (2004, 2013), MacPhee et Sattayanuwat (2014) montrent d'ailleurs l'existence d'une hétérogénéité des effets moyens des AP africains sur le commerce intra-zone selon leur degré d'intégration commerciale (ZLE, CU, UM). Avant d'aller plus loin dans nos démonstrations, il est intéressant de présenter brièvement les fondements théoriques de l'outil empirique mobilisé tout au long de ce travail, à savoir le modèle de gravité.

Celui-ci représente l'une des plus importantes réussites dans le domaine empirique en ayant produit les résultats les plus claires et robustes en économie (Leamer et Levinsohn, 1994 ; Feenstra et *al.*, 2001 ; Anderson, 2011). Cette approche *ex-post*<sup>14</sup> utilise des données sur un certain nombre de périodes afin d'analyser quantitativement les effets passés d'une politique ou bien de facteurs liés au commerce. Les travaux pionniers de Tinbergen (1962), de Pöyhönen (1963), de Pullianen (1963) ou encore de Linnemann (1966) ont posé les jalons en appliquant la loi de gravitation de Newton à une intuition économique basée sur les échanges. A l'instar

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<sup>14</sup>L'approche *ex-ante* implique la mise en oeuvre de simulations en projetant les effets futurs d'un changement dans la politique commerciale sur un ensemble de variables d'intérêt, notamment à partir de modèles d'équilibre partiel ou général (Piermartini et Teh, 2005).

des planètes qui sont mutuellement attirées en proportion de leur taille et de leur proximité, les flux commerciaux bilatéraux entre pays sont proportionnels à la taille économique des partenaires commerciaux (PIB) et inversement proportionnels à la distance géographique les séparant. Le modèle de gravité a ainsi été longtemps considéré comme un “orphelin intellectuel” (Anderson, 2011) en étant déconnecté des principaux courants de la pensée économique, et plus particulièrement des théories du commerce international. Cette carence a par la suite été très vite comblée par une profusion de fondements théoriques qui a marqué, à n’en pas douter, les trois grandes évolutions de ce modèle empirique au sein de la littérature économique (Baldwin et Taglioni, 2006 ; Head et Mayer, 2014).

Les modèles que nous appelons de 1<sup>ère</sup> génération comprennent les travaux qui ont apporté les premiers fondements microéconomiques. Ainsi, Anderson (1979) s’est particulièrement appuyé sur les hypothèses d’Armington (1969) : les produits sont différenciés selon l’origine du pays, la présence de préférences homothétiques<sup>15</sup> renvoyant à la théorie microéconomique du consommateur, chaque pays est spécialisé dans la production d’un bien unique imparfaitement substituable, les coûts commerciaux sont modélisés comme des coûts de type “iceberg”<sup>16</sup>. Par la suite, Bergstrand (1985, 1989) montre que le modèle de gravité est une conséquence directe du modèle en concurrence monopolistique de Krugman (1980). En clair, des pays identiques échangent des biens différenciés selon le goût des consommateurs pour la variété levant ainsi l’hypothèse restrictive de la localisation de la production d’Armington. Deardorff (1998) est allé plus loin en arguant que le modèle de gravité pouvait être

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<sup>15</sup>A la suite d’une variation du revenu, la demande de bien change dans la même proportion que le revenu.

<sup>16</sup>“De même qu’un iceberg fondrait en route si l’on souhaitait le déplacer sur une longue distance, on considère que le coût de transport est payé en unités du bien transporté. Ainsi, pour pouvoir disposer d’une unité d’un bien importé, un consommateur devra en acheter une fraction du chargement ayant tout simplement disparu en cours de route” (Crozet, 2009).

fondé à partir des théories (néo)classiques du commerce international. Il a repris le modèle de base d'Anderson (1979) en distinguant deux situations dans le modèle Heckscher-Ohlin<sup>17</sup> : un commerce avec et sans frictions<sup>18</sup>.

Les modèles de 2<sup>e</sup> génération s'illustrent particulièrement à travers les concepts de résistance multilatérale (Anderson et van Wincoop, 2003) et d'hétérogénéité des industries (Eaton et Kortum, 2002). D'un côté, Anderson et van Wincoop (2003) reprennent en grande partie le cadre théorique d'Anderson (1979) en montrant que les flux commerciaux sont influencés par l'existence de coûts commerciaux relatifs et non absolus. Leur non-prise en compte a conduit à biaiser les estimations jusque-là. Dit autrement, "étant donné le niveau des coûts bilatéraux au commerce, deux pays qui font face à d'importantes frictions dans leur commerce avec le reste du monde auront tendance à commercer plus entre eux que s'ils avaient un meilleur accès au reste du monde" (Carrère et Masood, 2015). D'un autre côté, Eaton et Kortum (2002) dérivent l'équation de gravité dans un modèle ricardien<sup>19</sup>, où chaque pays produit un très grand nombre de biens qui sont homogènes entre eux et avec une productivité hétérogène pour chaque pays et biens.

Les modèles de 3<sup>e</sup> génération sont obtenus à partir d'un modèle théorique du commerce international<sup>20</sup> en différenciant les biens selon l'hétérogénéité des firmes. Chaque firme se différencie par leur niveau de productivité, où seules les plus pro-

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<sup>17</sup>Un pays va produire et donc exporter le bien utilisant intensivement le facteur dont il est relativement bien doté.

<sup>18</sup>C'est-à-dire aucune barrière aux échanges (tant qualitatives que quantitatives) et l'autre cas en prenant compte par exemple les coûts de transport

<sup>19</sup>Les différences technologiques sont la principale source de l'avantage comparatif, où chaque pays peut participer aux échanges en se spécialisant dans le produit qu'il fabrique à moindre coût et pour lequel la productivité du travail est la meilleure par rapport à son partenaire.

<sup>20</sup>Le modèle de Dixit-Stiglitz (1977) en concurrence monopolistique considère un pays avec une industrie dotée de biens différenciés, une technologie identique pour tous les biens, le travail comme seul facteur de production, une libre entrée sur le marché et chaque firme a un pouvoir de marché sur la variété qu'il produit. Krugman (1979) l'applique dans une économie ouverte.

ductives exportent en faisant face à des coûts fixes à l'exportation<sup>21</sup> (Chaney, 2008 ; Helpman et *al.*, 2008). Melitz (2003) souligne que les entreprises les moins productives quittent le marché (effet de sélection) en redistribuant leurs parts de marché entre les entreprises les plus productives (effet de redistribution) pour fournir le marché intérieur et extérieur. Melitz et Ottaviano (2008)<sup>22</sup> ont, par exemple, montré que plus les firmes sont homogènes plus l'influence des coûts commerciaux sera importante. Quant à Chaney (2008), il montre que l'ouverture commerciale provoquerait aussi bien l'arrivée de nouvelles firmes (marge extensive) que la hausse des quantités exportées (marge intensive) à partir du degré d'hétérogénéité. Il a ainsi procédé à une décomposition de la variation des échanges commerciaux selon différentes marges. Cette brève revue de la littérature théorique relative au modèle de gravité nous permet d'aborder maintenant les contributions de ce travail de thèse.

Le premier chapitre de cette thèse étudie les principaux déterminants des flux commerciaux bilatéraux entre l'ASS et les BRICs dans le cadre du commerce Sud-Sud. Ce groupe d'économies émergentes a en commun un intérêt croissant pour le continent Africain depuis ces dernières années suite au récent réveil économique de cette région en développement. Ainsi, la contribution de ce chapitre se situe au niveau empirique en démontrant que les effets moyens des déterminants des échanges bilatéraux sont spécifiques aux caractéristiques des partenaires commerciaux. Nous faisons ainsi apparaître à la fois des similitudes et des différences au sein même des BRICs dans les échanges commerciaux avec l'ASS. Les résultats suggèrent qu'il existe une hétérogénéité entre les BRICs dans leurs relations commerciales avec l'ASS avec

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<sup>21</sup> "Il s'agit de coûts que les entreprises ne supportent qu'une fois pour accéder à un marché étranger, tels que le coût de l'information sur le marché, le coût de l'établissement d'un système de distribution, ou le coût du respect des règlements techniques étrangers" (OMC, 2012).

<sup>22</sup>Ils ont développé un modèle de gravité toujours dans ce cadre d'analyse en remplaçant l'élasticité de substitution constante (CES) par une préférence quasi-linéaire (le surplus tend à représenter la satisfaction exacte apportée par le consommateur du bien considéré).

le rôle singulier de la Chine dans celles-ci. En d'autres termes, certains facteurs explicatifs des échanges commerciaux<sup>23</sup> divergent que cela soit le Brésil, la Russie, l'Inde ou la Chine en tant que partenaire commercial de l'ASS.

Il est généralement admis que les échanges commerciaux des pays africains se caractérise par un faible commerce intra-zone et une structure des échanges encore fortement concentrée. Dans le second chapitre, nous tentons d'apporter des preuves empiriques concernant, d'une part, l'impact des échanges commerciaux des BRICs avec l'ASS sur le niveau du commerce intra-Africain, et d'autre part, sur la diversification géographique de ce dernier en termes de nouveaux partenaires commerciaux. Amighini et Sanfilippo (2014) démontrent que le choix des partenaires commerciaux est un facteur décisif dans la diversification commerciale des PED surtout dans les relations Sud-Sud. Notre analyse empirique a alors tenté de valider cette intuition développée récemment selon laquelle le commerce Sud-Sud est un déterminant fondamental notamment dans la diversification géographique des échanges des PED.

Le troisième chapitre propose d'évaluer empiriquement l'existence d'un basculement des échanges commerciaux depuis l'indépendance des anciennes colonies vers la Chine. En effet, la décolonisation fut une étape décisive dans le processus d'intégration économique des ex-colonies avec, pour la majorité d'entre elles, un affaiblissement des relations avec leurs anciens colonisateurs. Cependant, les travaux existants trouvent des résultats opposés quant à une éventuelle réorientation des flux commerciaux des anciennes colonies vers le RDM suite à leur indépendance. Ici, nous nous focalisons en particulier sur le cas de la Chine avec ces pays du fait de la place centrale de cette dernière dans les relations commerciales. Nous essayons donc d'apporter deux principales explications quant à une éventuelle réorientation de ces

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<sup>23</sup>Distance géographique, indice de dissimilarité du revenu, régime démocratique, langue commune, pays riches en ressources naturelles, adhésion à l'OMC et termes de l'échange.

échanges commerciaux vers la Chine : la croissance du PIB des partenaires commerciaux (surtout celle de la Chine) et l'effet redistributif causé par l'augmentation des coûts commerciaux bilatéraux après l'indépendance.

Les résultats empiriques de ces trois premiers chapitres établissent quelques caractéristiques fondamentales de cette “nouvelle” géographie du commerce international, à savoir une hétérogénéité au sein des pays émergents au niveau des facteurs explicatifs des flux commerciaux Sud-Sud, un commerce Sud-Sud vecteur de diversification géographique des échanges des économies en développement en termes de partenaires commerciaux, et un basculement des échanges commerciaux des ex-colonies vers la Chine au détriment des anciens colonisateurs depuis l'indépendance.

Dans le quatrième chapitre, nous nous intéressons au lien entre la diplomatie économique et le commerce international. Plus précisément, nous abordons une thématique relativement peu étudiée par la littérature existante concernant le rôle de la politique extérieure chinoise dans les relations commerciales avec ses partenaires commerciaux. Le “consensus de Beijing” et la politique de la Chine unique représentent les deux piliers de la politique étrangère chinoise. Effectivement, la situation de Taiwan illustre parfaitement l'utilisation de la diplomatie économique par les autorités chinoises pour assurer ses intérêts nationaux. Nous examinons les effets éventuels qu'aurait la politique de la Chine unique sur les flux commerciaux bilatéraux de la Chine et de Taiwan. Afin d'approximer au mieux cette politique de la Chine unique, nous avons recours, d'une part, aux votes sur la résolution de l'ONU de 1971 portant sur la reconnaissance officielle de la RPC comme la seule représentante de la Chine au détriment de Taiwan, et d'autre part, à l'établissement de relations diplomatiques avec la Chine. Ce chapitre offre les premières preuves empiriques que la diplomatie économique chinoise, à des fins stratégiques, compte dans les relations commerciales aussi bien Nord-Sud que Sud-Sud.

Le cinquième et dernier chapitre vise à examiner l'impact de l'intégration régionale Sud-Sud, via les AP auxquels participent les pays d'ASS, sur les flux commerciaux bilatéraux. De manière plus précise, notre contribution réside dans la prise en compte de l'hétérogénéité de ces AP sur le commerce à partir de leurs formes (ZEP, ZLE, UD), de leurs natures (réciproques ou non-réciproques) et des partenaires commerciaux (pays membres et pays tiers). A ceux-là, les questions de chevauchement des AP (Lee et *al.*, 2008 ; Sorgho, 2016) appliquée à l'ASS ainsi que la mise en oeuvre progressive (phase-in) de ces derniers dans le temps (Baier et Bergstrand, 2007, Baier et *al.*, 2014, 2015) viennent enrichir notre travail. Dans nos estimations, les hypothèses testées empiriquement prennent en considération les deux recommandations suivantes, ce qui représente un apport important de ce chapitre par rapport aux travaux existants. D'un côté, amalgamer tous les types d'accords commerciaux ensemble en une seule variable muette dans les équations de gravité conduit à une erreur de mesure de la variable d'intérêt (Kohl et Trojanowska, 2015). D'un autre côté, le signe, l'ampleur et la significativité des coefficients obtenus dépendent à la fois des caractéristiques des AP étudiés et des méthodes d'estimation (Carrère, 2006 ; Baier et Bergstrand, 2007 ; Kandogan, 2008).

# Chapter 1

## Characterising South-South trade flows: the case of sub-Saharan Africa and BRICs<sup>1</sup>

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<sup>1</sup>This chapter corresponds to the paper “Characterising bilateral trade flows between SSA and BRICs: What does the gravity model tell us?” written with Jean-François Hoarau.

## 1.1 Introduction

A striking observation emerges over the recent period relative to the structure of international economic relations. Part of the developing world has gained momentum and competes today with the “old” industrialised countries for leadership in the world economy (Moghadam, 2011). Among this emerging group, the BRICs (Brazil, Russia, India and China) are predominant. From 2000 to 2008, they accounted for half of the world economic growth while the rest was still largely generated by some developed countries (United States, United Kingdom, Germany, France, Canada and Italy) up to the end of the 20<sup>th</sup> century. Moreover, recent studies forecast that these new “economic giants” will contribute 61% of world GDP against only 13% for the industrialised countries from 2008 through 2014. At the same moment, many sub-Saharan African (SSA) countries display an economic growth performance significantly higher than during the past three decades (Martinez and Mlachila, 2013). Recent analysis seems to confirm that this region resisted the international crisis without major damages, since 2008, although the world was hurt by a global contraction of more than 2%: SSA always showed economic growth rates above 2% (Allen and Giovannetti, 2011).

These two interesting changes are, of course, related. The growing importance of these emerging economies has given a significant push to the economic growth of most countries belonging to the subcontinent<sup>2</sup>, which constitutes a crucial factor for a sustained economic development process in the long run<sup>3</sup> (Moghadam, 2011 ; He, 2013). Note that this results mainly from foreign trade<sup>4</sup>. In this regard, three

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<sup>2</sup>These good economic performances were also driven by the implementation of sound macroeconomic policies in many African economies over the recent period.

<sup>3</sup>The BRICs’ contribution to sub-Saharan Africa’s economic growth also rose during the international financial crisis, especially for raw goods exporters.

<sup>4</sup>Productivity gains in the BRICs and inward foreign direct investment flows from BRICs are

elements must be discussed. First, bilateral trade flows have strongly increased since the beginning of the 2000s due to narrow complementarities between comparative advantages of Africa and increasing energy needs from the productive sector of the BRICs. Even if the European Union and the United States are main partners of Africa, their share in African trade has decreased significantly and continuously in favour of the new giants of the world economy (Subramanian and Matthijs, 2007). Furthermore, the BRICs became the first trade partners of SSA among the whole developing world. Second, the BRICs' economic rise created a good climate for African producers<sup>5</sup> by improving terms of trade due to the increase in raw goods prices<sup>6</sup> (Zafar, 2007 ; Wang, 2007). Third, BRICs give the opportunity to African consumers to benefit from cheap imports.

Among this group, one country, namely China, largely differs from the others by its contribution to the global growth (one-fourth of the world GDP growth) and its share in SSA trade. The new direction of Chinese foreign policy (Gu et al., 2008 ; Brautigam, 2010), its dependence on energy resources and the need to strengthen basic infrastructure in Africa led to a strong rise in China-SSA trade by a 168 factor for African exports and by a 5.4 factor for African imports from 1980 through 2009. China has become today the first exporting country and the second-largest importing country of African goods, just behind the United States (De Grauwe et al., 2012). "The trade channel accounts for around 60 percent of the impact of BRICs on LIC

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other significant factors.

<sup>5</sup>Note that the development of the BRICs, and in particular of China, has also had some adverse effects on the African productive sector. Indeed, Chinese exports in manufactured goods compete directly with African industrial goods in both internal and external markets (Kaplinsky and Morris, 2008 ; Renard, 2011). In several African countries, infant industries in the textile and clothing sectors have been crowded out by Chinese low-cost imports (Subramanian and Matthijs, 2007).

<sup>6</sup>The increase in world prices of raw goods results from a demand effect due to the rapid development of industrial activity and thus energetic needs in the new, large, emerging countries.

growth. [...] The response in African LICs is particularly strong, reflecting the growing trade ties that these countries have forged with BRICs in recent years” (Moghadam, 2011). So it is not surprising that a large part of the literature focuses on the specificities and the determinants characterising trade relations between China and SSA countries (Zafar, 2007 ; De Grauwe et al., 2012).

Contrary to China, very few works have studied trade relations between SSA economies and the three other BRICs (Moghadam, 2011). However, their share in world trade and in Africa is growing sharply (World Bank, 2011). Thus it is also crucial to identify what drives trade flows between SSA and Brazil, India and Russia. Otherwise, BRICs do not constitute a homogeneous group in the international trade area (Cooper and Fues, 2008 ; Moghadam, 2011). In the first place, China, India and Brazil mainly import natural resources (oil, minerals, metals), contrary to Russia, which is well endowed in this domain. Second, China exports almost exclusively manufactured and capital goods, although the three others show a more diversified structure with a notably significant part of agricultural goods. Then, we cannot generalise the Chinese case to the other group members.

This article aims at studying the nature of this surge in trade between SSA and BRICs (Parikh and Shibata, 2004 ; Jenkins, 2006) through South-South trade. What explains the rise of the BRICs in Africa? Do these trade factors differ across BRIC countries in SSA trade relationships? From a worldwide database over the period 1980-2012<sup>7</sup>, we introduce into the gravity model specific interaction terms to identify relationships between SSA and each BRIC country, taken individually, with some control variables traditionally used by the specialised literature (income dissimilarity, geographic distance, language, democracy, WTO membership, resource endowments, and terms of trade). This approach better captures the heterogeneity of

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<sup>7</sup>Database (Head et al., 2010): <http://strategy.sauder.ubc.ca/head/sup/index.html>.

BRIC countries as far as bilateral trade flows with SSA is concerned. More precisely, we use a structural gravity equation theoretically founded by taking into account multilateral resistance developed by Anderson and van Wincoop (2003) through fixed effects, and robust by resolving both omission bias and heteroskedasticity with a PPML-fixed effects estimator (Santos Silva and Tenreyro, 2006 ; Santos Silva and Tenreyro, 2011 ; Fally, 2015). Finally, these econometric methods should allow us to test whether the trade factors linking SSA and BRICs are country-specific.

The rest of this chapter is structured as follows. Section 2 presents an overview of trade relationships between SSA and BRICs. Section 3 exposes the gravity specifications and the estimation methods retained. Section 4 shows and discusses the results. Section 5 concludes.

## **1.2 Overview of trade relationships between SSA and BRICs**

### **1.2.1 BRICs' strategies in SSA**

The SSA's historical trading partners, namely the European Union (EU) and the United States, still hold a key role in the African trade pattern. Nevertheless, we observe significant erosion, essentially for European countries, since SSA independence (Head et *al.*, 2010). Indeed, between 1995 and 2010, the share of EU trade in African exports fell from 34.3% to 22%. At the same time, this increased from 16.8% to 24% for the United States. Actually the recent structural changes in African trade, as we will see, has mainly benefited to the BRICs (Moghadam, 2011).

We undertake a comparative analysis of each BRIC's strategies in SSA by emphasizing the heterogeneity of their aims and needs in this developing region. On the one

hand, these economies have some commonalities: (i) each of them are regional powerhouses but also the main drivers of the world economic growth and South-South trade since these past decades; (ii) this surge of trade, investment and development aid in SSA clearly appears since the beginning of the 2000s and this is the largest increase compared with the other developing regions; (iii) these emerging countries successively implemented strong economic reforms outwardly turned such as China in the 1980s, India in the 1990s and Brazil-Russia in the 2000s; (iv) BRIC countries created economic and political official forums with Africa<sup>8</sup> and they are also important contributors in terms of peacekeepers in Africa with the largest contribution for China; (v) combination of African comparative advantages in resources with the BRIC' strategic complementarities in capital and technology. On the other hand, differences appear concerning the engagement of BRICs in SSA (Table 1).

Table 1.1: BRIC's engagements in SSA

Brazil	Russia
Primary commodity suppliers in agricultural products and natural gas	
Investment sectors in biofuel, infrastructure and banking	Investment in fuel and energy sectors
Technical assistance with transfer technology	Bilateral aid in education and food security
Distinction between private and state-owned firms	Intervention of state-owned firms privileged
India	China
Cheap labour and labour intensive manufacturing benefiting both African consumers and intermediate users	
Companies are searching for manufacturing niches	Investments in resource-rich countries
Unconditional loan and financial agreements	
Distinction between private and state-owned firms	Intervention of state-owned firms privileged

Source: UNECA (2013, 2014).

<sup>8</sup>Forum on China-Africa Cooperation (FOCAC) since 2000, Africa-South America summit since 2006, India-Africa summit since 2008, Russian-African forum since 2015.

### 1.2.2 Some stylised facts

Figure 1 reports clearly the upsurge of bilateral trade between SSA and BRICs since the beginning of the 21<sup>st</sup> century. Two trends illustrate this global finding: (i) the perfect reverse relation between the trade evolution of EU and BRICs with African countries from 1995 to 2012, and (ii) the weight of China that is becoming more and more important within this group: for instance Chinese exports to SSA have been multiplied by nine over this period. Note that the Chinese accession to WTO since 2001 has probably promoted bilateral trade flows with the other WTO members (Shafaedin, 2004), and, especially, with African members<sup>9</sup>.

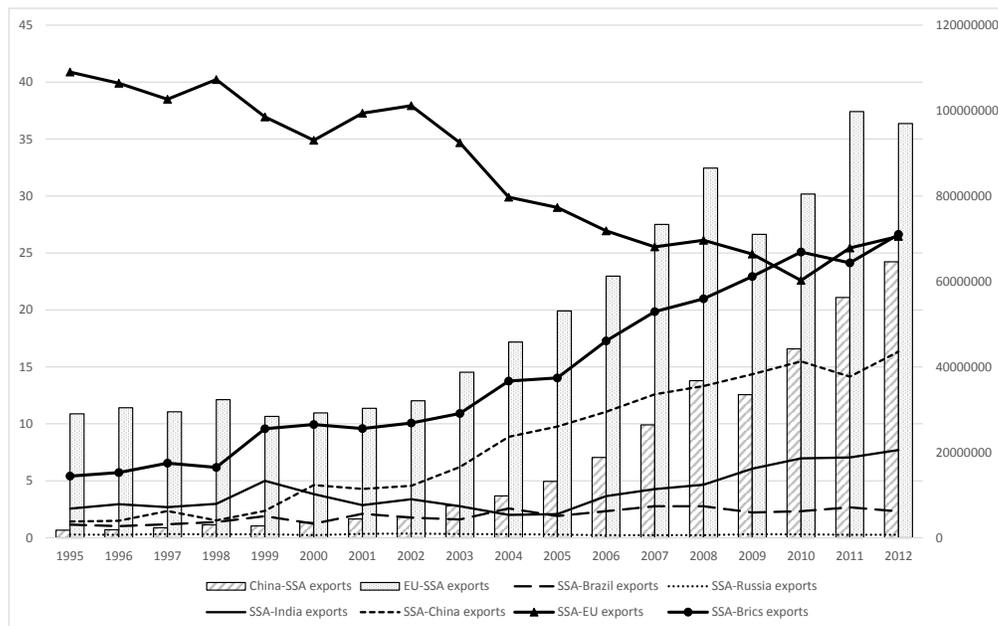
Several features characterise trade relations between SSA and the BRICs. First, we observe a geographic trade concentration phenomenon in a few African countries (Table 2). The same situation also appears in the case of North-South trade. Indeed, South-Africa, Nigeria and Angola explain more than 60% of overall bilateral trade<sup>10</sup>. Second, this trade concentration also concerns the nature of traded products. According to their comparative advantages and intrinsically to their factorial endowments (Figure 2), African economies principally export to BRICs raw materials (about 70%) composed of oil (52%), mineral (8%) and precious stones (4%). Focusing on the imports from the BRICs, we show that manufactured products, such as miscellaneous manufactured articles and equipment (machinery and transport), dominate this side of trade. They respectively represent 26% and 20% of total imports, and on chemical products (15%). Concerning SSA terms of trade, we clearly observe that they have increased since 2000-2001 to achieve an index less than 170 in 2012 against less than 70 in 2000, that is, more than double during one decade.

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<sup>9</sup>“Only North African countries and Malawi have a noticeable number of export items in common with China in their export structure” concerning the African region (Shafaedin, 2004).

<sup>10</sup>The Indian structure of imports is characterised by a more geographic diversification because of its strategic position in the Indian Ocean.

Figure 1.1: SSA-BRICs trade expansion (in % and in thousands dollar).



Source: UNCTAD, authors calculations.

This improvement is mainly sustained by SSA countries richly endowed in natural resources due to the rising demand for natural resources essentially from emerging economies such as China and India (Jenkins and Edwards, 2006).

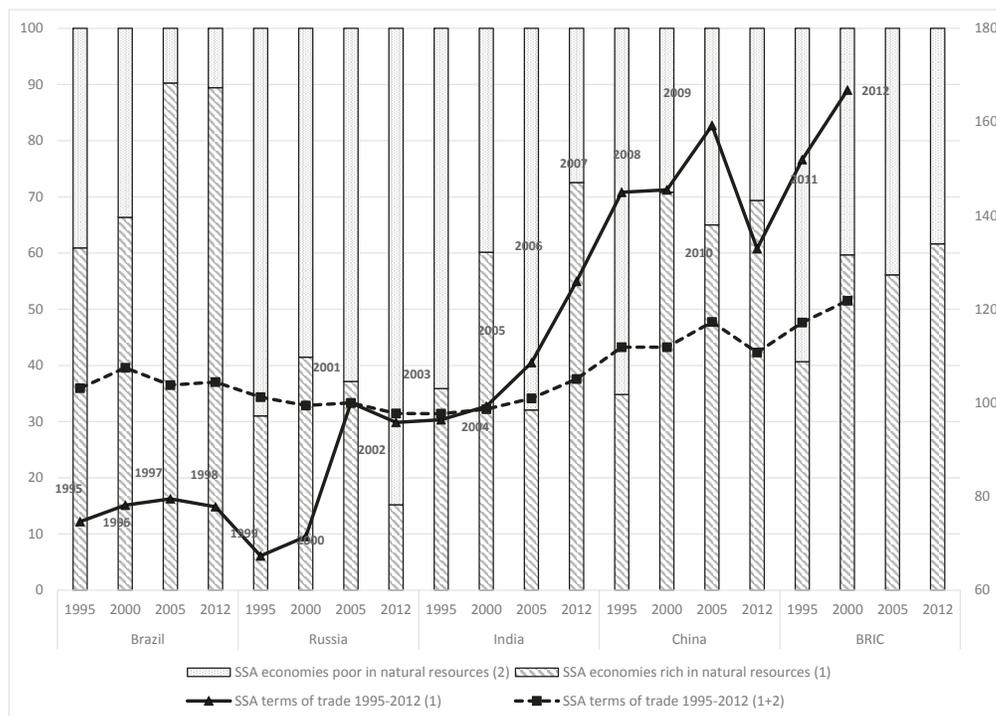
Table 1.2: List of main trading partners in SSA-BRICs trade relations (1995-2012)

	<b>Brazil</b>	<b>Russia</b>
<i>SSA exports to BRICs</i>	Nigeria (67.7%)	South-Africa (21.82%)
	South-Africa (12.66%)	Ivoiry Cost (19.98%)
	Angola (5.6%)	Guinea (19.58%) Ghana (8.23%)
<i>BRICs exports to SSA</i>	South-Africa (30.54%)	Nigeria (17.22%)
	Nigeria (25.47%)	Ethiopia (12.59%)
	Angola (14.05%)	Liberia (12.54%)
		Sudan (9.15%)
		South-Africa (8.31%)
		Angola (6.88%)
		Kenya (6.37%)
	<b>India</b>	<b>China</b>
<i>SSA exports to BRICs</i>	Nigeria (49.04%)	Angola (33.05%)
	South-Africa (21.30%)	South-Africa (21.49%)
	Angola (6.42%)	Sudan (12.21%)
<i>BRICs exports to SSA</i>	South-Africa (21.12%)	South-Africa (27.79%)
	Nigeria (14.71%)	Nigeria (15.69%)
	Kenya (10.86)	Sudan (5.87%)
	Tanzania (5.65%)	Ghana (4.42%)

Source: UNCTAD, authors calculations. Lecture (in parentheses): Nigeria represents 67.7% of the total of SSA exports to Brazil whereas South-Africa represents 30.54% of the total of Brazilian exports to SSA over the period 1995-2012.

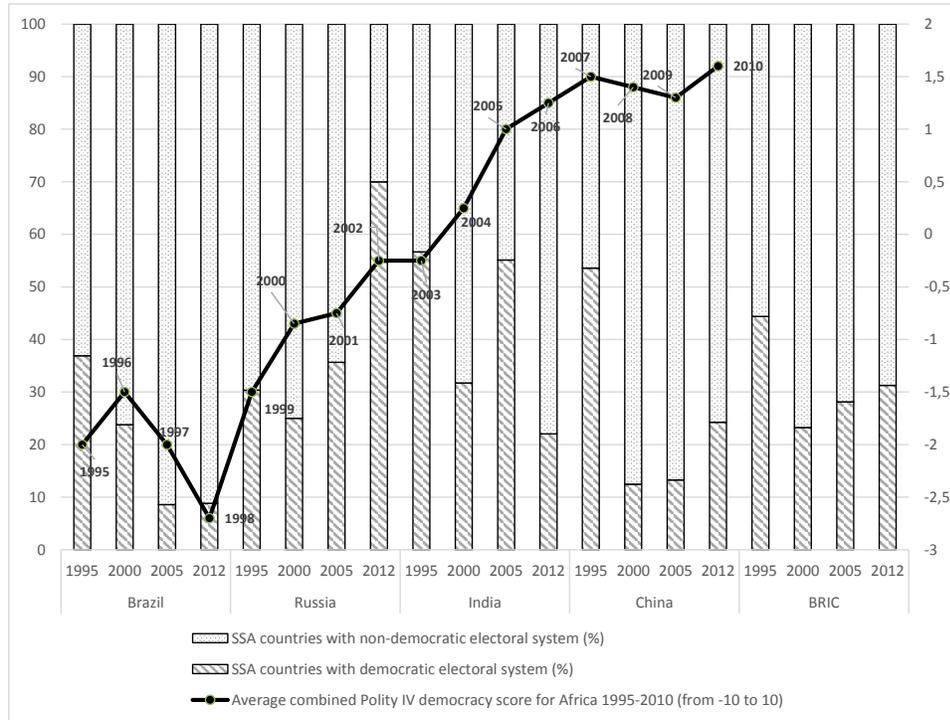
Furthermore, concerning Brazil and Russia, some significant differences appear when we look at the structural composition of traded products. On the exports side, contrary to other BRICs, Russia shows a relatively diversified trade structure.

Figure 1.2: Structure of African exports (in %) and terms of trade (2000 = 100).



Source: UNCTAD and World Bank, authors calculations.

Figure 1.3: SSA's exports with BRICs and democracy.



Source: Polity IV, authors calculations.

Considering that this economy is rich in natural resources (oil, gas and mineral), the complementary property with African countries does not exist. The main exports are food products (more than 40% in 2010), minerals (15%), beverages and tobacco (10%). Manufactured articles represent less than 10%. On the imports side, being specialised in the agrifood industry, Brazil shows a singularity. Contrary to the three other BRICs which export mainly manufactured products, the first import post is food (more than 30%) then equipment (20%) and miscellaneous manufactured articles (15%).

It is also worth noting that a democratisation process in SSA accompanies this trade reorientation (Gylfason, 2013)<sup>11</sup>. We observe that the democracy index for Africa grows remarkably even if the score remains very low (Figure 3). However, note that except for Russia, BRICs countries have principally “non-democratic” trading partners, like some African countries richly endowed in natural resources (Angola, Equatorial Guinea, Nigeria, Gabon, Chad, Sudan)<sup>12</sup>.

All in all, this short overview relative to the stylised facts put forward three main elements that all robust empirical models must take into account as long as trade between SSA and BRICs is concerned: (i) the growing economic weight of China within BRICs, (ii) the heterogeneity amongst BRICs leading to the need of a differentiated empirical analysis, and (iii) the potential importance of several factors (democracy, terms of trade, natural resources, income dissimilarity index, and accession to WTO).

### **1.3 Methodological approach: The augmented gravity specification**

To estimate the ex-post impact of trade determinants, we use a traditional tool in international trade, namely the gravity model. The theoretical foundations of this model are already well known and have evolved over time. Starting from the application of the Newton’s law of gravity in international trade (Tinbergen, 1962 ; Head and Mayer, 2014), they have progressively improved by integrating microeconomic

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<sup>11</sup><http://www.voxeu.org/article/democracy-africa>.

<sup>12</sup>Note that Arezki and Gylfason (2013) find that high natural resource rents lead to the development of corruption, which deteriorates democratic institutions for those SSA countries so richly endowed.

development as the Armington hypothesis<sup>13</sup> (Anderson, 1979), differences in factor endowments (Bergstrand, 1989 ; Deardorff, 1998), the new international trade theory<sup>14</sup> framework (Helpman and Krugman, 1987 ; Anderson and van Wincoop, 2003) and the firms heterogeneity hypothesis (Melitz, 2003 ; Chaney, 2008 ; Melitz and Ottoviano, 2008).

### 1.3.1 The model and the empirical specifications

Equation 1 shows the economic intuition derived from Newton’s law with the positive and proportional effect of economic size of trading partners ( $Y_i, E_j$ ) on bilateral trade ( $X_{ij}$ ), and the reverse effect of trade costs ( $\tau_{ij}$ ) such as geographic distance and trade costs across the other export and import markets through relative price effects ( $P_i, P_j$ ). Indeed, based on Armington hypotheses about specialisation, identical constant elasticity of substitution ( $\sigma$ ) and the theoretical-consistent background developed by Anderson and van Wincoop (2003), the theoretical gravity equation holds:

$$X_{ij} = \left( \frac{Y_i E_j}{Y_w} \right) \left( \frac{\tau_{ij}}{P_i P_j} \right)^{1-\sigma} \quad (1.1)$$

Foremost, note that our empirical simulations are implemented by using panel samples based on a worldwide database developed by Head, Mayer and Ries (thereafter HMR)<sup>15</sup> over the period 1980-2012<sup>16</sup>. Overall, there is a large consensus in the economic literature about the fact that estimation of the gravity equation in panel

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<sup>13</sup>That is homogeneous goods, traded goods differentiated by country of origin, imperfect substitute goods.

<sup>14</sup>This framework is based on monopolistic competition, economies of scale, increasing returns and transport costs.

<sup>15</sup><http://strategy.sauder.ubc.ca/head/sup/index.html>

<sup>16</sup>We choose this time period for two main reasons: (i) a very low level of trade flows appears between SSA and BRICs before the 1980s, and (ii) China has implemented outward-oriented economic reforms since the end of 1970s.

samples is more effective than in cross-section (Matyas, 1997 ; Egger and Pfaffermayer, 2003). Specifically we use the traditional log-linear version of an augmented gravity model based on variables widely used in the applied literature to characterise the trade flows between SSA countries and BRICs ( $X_{ijt}$ ). Trade is thus analysed in its double dimension, that is, SSA's exports to BRICs and BRICs exports to SSA.

$$\ln X_{ijt} = \beta_0 + \beta_1 D_{ijt} + \beta_2 F_{ij} + \beta_3 \mathbf{I}_{ijt} + \gamma_{i(j)t} + \varepsilon_{ijt} \quad (1.2)$$

$$\ln X_{ijt} = \beta_0 + \beta_1 \ln M_{i(j)t} + \beta_2 D_{ijt} + \beta_3 \mathbf{I}_{ijt} + \gamma_{ij} + n_t + \varepsilon_{ijt} \quad (1.3)$$

$$\ln X_{ijt} = \beta_0 + \beta_1 D_{ijt} + \beta_3 \mathbf{I}_{ijt} + \gamma_{i(j)t} + \gamma_{ij} + n_t + \varepsilon_{ijt} \quad (1.4)$$

Equations 2 to 4 contain control variables with  $M_{i(j)t}$ ,  $D_{ijt}$ ,  $F_{ij}$  respectively representing time-varying monadic variables (terms of trade index, democracy, natural resources), time-varying dyadic variables (GDP per capita dissimilarity, GATT-WTO membership) and time-fixed dyadic variables (geographic distance and common language). Moreover, insofar as bilateral trade flows can differ depending on the BRIC' members considered, our empirical specification must take BRICs individually. Therefore, our variable of interest ( $\mathbf{I}_{ijt}$ ) is an interaction term of a dummy variable taking the value 1 (0 otherwise) for the presence of relations between SSA-BRICs and each control variable. To have robust<sup>17</sup> and theoretically founded estimations, we include (country-time, country-pair and time) fixed effects, respectively, with  $\gamma_{i(j)t}$ ,  $\gamma_{ij}$  and  $n_t$  to correct the endogeneity bias (Baier and Bergstrand, 2007 ; Lavallée and Lochard, 2015) and omission bias by taking into account multilateral resistance<sup>18</sup> (Anderson and van Wincoop, 2003).

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<sup>17</sup>We also improve our regressions with a Huber-White estimator to avoid a heteroskedasticity bias in order to have robust standard errors clustered by country-pair.

<sup>18</sup>This major issue captures other trade costs across the other export and import markets through relative price effects ( $P_i$ ,  $P_j$ ). The exclusion of these terms leads to an omission bias with more

### 1.3.2 Variables: definition and economic intuition

The interaction variables retained allow to better grasp some main characteristics (Table 3) of these South-South trade relations.

#### Income dissimilarity index

We use an income dissimilarity index to take into account the heterogeneity within developing countries. In our case, we observe several level of economic development in SSA, where differences appear also relative to BRICs (Table 10). The expected sign can be both positive and negative. A positive sign could support the inter-industry trade hypothesis in the spirit of Hecksher, Ohlin and Samuelson (HOS) to the extent that income dissimilarities imply different factor endowments. A negative sign, on the contrary, corroborates the intra-industry trade approach of Linder (1961) stating that income dissimilarities intensify trade by increasing the amount of demand overlap<sup>19</sup>. The GDP p.c. dissimilarity (absolute value) is “measured by  $|\frac{y_{it}-y_{jt}}{(y_{it}+y_{jt})}|$ , where  $y$  is real GDP per capita measured in PPP-based constant 2000 US dollards” (Cheong et al., 2015). This index is bounded between -1 and +1 where the value of zero indicates identical level of development between countries.

#### GATT-WTO

The multilateral trade liberalisation through the GATT-WTO agreements raised the matter of their influence in the strong development of South-South trade in

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unobserved trade barriers. To the extent that it is very difficult to have price indices for each country of the sample, fixed effects through country and country-pair allow us to account for this multilateral resistance even if some variables will be removed according to the fixed effects used.

<sup>19</sup>“Even without a PTA, countries more similar in size, income and location trade more than those less similar” (Cheong et al., 2015) because similar demand structures could increase trade gains (McPherson et al., 2001)

the world trade, especially since the China's accession in 2001 compared with the other BRICs. The expected sign is positive due to the reduction of trade barriers with a tariff liberalisation between member countries even if a heterogeneity can appear according to the nature of trading partners (Subramanian and Wei, 2007). The GATT-WTO variable<sup>20</sup> takes 1 if trading partners are WTO's members, and 0 otherwise.

### Terms of trade index

Two periods appear in the historical evolution of terms of trade for developing resource-rich economies with a deterioration until the 1990s and then an improvement, essentially due to the growing demand of emerging countries, notably "Asian giants", in natural resources to sustain their economic development. In accordance with the Marshall-Lerner effect (Bahmani et al., 2013), an improvement in terms of trade is supposed to exert a negative impact on exports and a positive one on imports (wealth effect) due to the deterioration of exports' price-competitiveness where the price effect is higher than the volume effect. The terms of trade index is "the percentage ratio of the export unit value indexes to the import unit value indexes, measured relative to the base year 2000"<sup>21</sup>.

### Natural resources

These South-South trade relations are mainly based on the increasing role of resource-rich countries, particularly SSA countries (Table 11), due to the economic interdependence with BRICs. The expected effect of this variable is positive because "if the

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<sup>20</sup>Note that Russia became a member in 2012 and China in 2001, whereas Brazil and India are founding members.

<sup>21</sup><http://data.worldbank.org/indicator/TT.PRI.MRCH.XD.WD>

demand for a natural resource is relatively high, the standard gains from trade will result, and free trade will increase the welfare of both the natural resource importing and exporting countries” (Emami and Johnston, 2000). The resource variable<sup>22</sup> equals 1 if SSA countries are richly endowed in natural resources and 0 otherwise.

## Democracy

The expected theoretical impact on trade flows is positive because “democratisation and its associated quality institutions can potentially reduce trade costs associated with the risks of trading by improving the trust in an exporter” (Yu, 2010). Moreover, a democratic political regime could be followed by a move to liberalise trade and so by an increase in trade flows. Indeed, Milner and Kubota (2005) point out that democratisation, which implies an increase in the electorate’s size, changes the calculations of political leaders about the optimal level of trade barriers. Then, implementation of trade policies that better promote the welfare of consumers/voters are desirable, which results in trade liberalisation in this context. Nevertheless, the principles of non-interference and unconditionality characterising the doctrine<sup>23</sup> of BRICs in South-South relations suggest that they don’t make differences between democratic and non-democratic countries (Table 11), that is to say an ambiguous effect (Makhlouf et al., 2015). The democracy variable<sup>24</sup> takes 1 if SSA countries have adopted a democratic electoral system and 0 otherwise.

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<sup>22</sup>A country is considered well endowed in natural resources when two conditions are met: (i) the value of the energy sector rents represents at least 5% of the gross national income and; (ii) the share of raw goods in exports exceeds 20% for at least five years from the reference period (Collier and O’Connell, 2007).

<sup>23</sup>[http://www.brics.utoronto.ca/docs/150709-ufa-declaration\\_en.html](http://www.brics.utoronto.ca/docs/150709-ufa-declaration_en.html)

<sup>24</sup>“There are three main and interdependent elements: (1) the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders, (2) the existence of institutionalised constraints on the exercise of power by the executive, (3) the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation”. For more precisions, refer to: <http://www.systemicpeace.org/inscr/p4manualv2013.pdf>.

### Geographic distance

The bilateral geographic distance between countries is “calculated following the great circle formula, which uses latitudes and longitudes of the most important cities/agglomerations (in terms of population)” as defined by the CEPII. The more geographically remote countries are, the less they will trade because of the costs of trade, that is, a negative impact on bilateral trade is expected (Disdier and Head, 2008).

### Common language

Shared a common language is a colonial legacy that can improve trade flows between developing countries having had the same colonizer such as Brazil and India with some former colonies in SSA (Table 11). This facilitates trade between partners by reducing transaction costs such as communication and translation (Lohmann, 2011 ; Egger and Lassmann, 2012). The language variable equals 1 if trading partners share a common language, and 0 otherwise.

Table 1.3: Data sources

<b>Variables</b>	<b>Sources</b>
Bilateral exports flows	DOTS (IMF) and COMTRADE (UN)
Real GDP per capita dissimilarity	Calculations based on Cheong <i>et al.</i> (2015)
GATT-WTO	WTO
Terms of trade index (2000 = 100)	World Bank & World Development Indicators
Democracy	Polity IV Annual Time-Series 1800-2014
Resource-rich countries	Collier and O’Connell (2007)
Distance	CEPII
Language	CEPII

Note: We use the worldwide database developed by HMR.

### 1.3.3 Methodological issues

Traditionally, the gravity model is estimated using the log-linear specification with ordinary least squares (OLS). Nevertheless, at least three main methodological problems result from this approach (Burger et al., 2009 ; Arvis and Shepherd, 2013 ; Gomez Herrera, 2013): (i) the “adding-up” bias created by the logarithmic transformation; (ii) the violation of the homoskedastic errors assumption and; (iii) the presence of zero trade flows in trade data. Among these, the last one is probably the most detrimental and debated today. Indeed, the log-linear form cannot deal with zero trade flows because the logarithm of zero is undefined. Some authors proposed conserving the log-linear form, rather deleting these observations or substituting them by a low positive value such as 0.5 or 1 (Bénassy-Quéré et al., 2007). If these flows sometimes reflect measurement problems or the lack of data, zero flows can also give precious information about the real absence of trade relations between countries. Then removing the null observations is not a good strategy from an economic viewpoint. The second method is no more suitable to the extent that the chosen value is arbitrarily determinate and does not rely on empirical and conceptual foundations (Linders and De Groot, 2006). Accordingly, we apply two alternative methods<sup>25</sup>.

For these reasons, the Poisson pseudo maximum likelihood (PPML) approach is preferred. PPML is applied to the trade flows variables taken in levels (not in logs), which allows us to estimate directly the multiplicative form of gravity equations, thus preserving the zero flows. This method provides two other decisive advantages. First,

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<sup>25</sup>Concerning the statistical treatment of zero flows, a third method, the Heckman (1979) method, exists in the literature. This latter is a two-step procedure. In the first step, a qualitative model is estimated in accordance with the probit approach. In a second step, a regression on the positive data with OLS or GLS is implemented by introducing the inverse of the Mills ratio as an explicative variable. Nevertheless, this method has two limits: the non-correction of heteroskedasticity and its suitability mainly for micro-firms data. Operationally, this approach is relevant when the zero flows are due to a deliberate choice of firms or countries not to export or import.

it is robust to the presence of heteroskedasticity (Santos Silva and Tenryro, 2006 ; Santos Silva, 2011 ; Fally, 2015). Second, PPML resolves the “adding-up” problem. Note that the Poisson model is vulnerable to the problem of over-dispersion and excess zero flows, whereas alternative specifications exist, such as negative binomial or zero-inflated Poisson (ZIP) estimators in specific cases. Due to the relative weak level of zero trade flows in our sample, we decided to privilege PPML instead of the other methods mentioned (Burger *et al.*, 2009). In other words, we implement PPML with dyadic fixed effects<sup>26</sup> to be theory-consistent.

## 1.4 Empirical results

The results are given in Table 4 and Table 5. To have a robust estimation, taking into account the main issues previously described, we focused on the results relative to the PPML-fixed effects specification<sup>27</sup> (Table 8). First of all, note that, considering the whole sample, all control variables have the expected signs.

### 1.4.1 SSA’s exports to BRICs

The results for SSA’s exports to BRICs are displayed in Table 4. First, when income dissimilarity index increases, we observe an increase in SSA’s exports to Brazil and India, whereas the results are not significant for Russia and China. These findings mean that African low income exporters trade more with Brazil and India. This is in line with the stylised facts about the trading partners.

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<sup>26</sup>Country-years fixed effects is a method “computationally burdensome and even impossible to apply in the case of large datasets that include many countries and years. [...] We therefore adopt another solution that consists of capturing these terms (multilateral resistance) with bilateral fixed effects.” (Lavallée and Lochard, 2015)

<sup>27</sup>In this chapter, we used four econometric specifications to examine whether the estimated coefficients are sensitive to the use of the PPML-fixed effects model.

Second, the presence of democratic systems in SSA countries increases African exports to Russia due to the presence of South-Africa like the main Russian trading partner. Otherwise, the findings are not significant for Brazil, India and China.

Third, when trading partners are GATT-WTO members, the estimated impact of SSA' exports to India and China is as expected. The Chinese accession to the WTO seems to have led to a trade-promoting effect due to the implementation of multilateral tariff liberalisation (Imbruno, 2016). Shafaedin (2004) shows that a complementary effect appears for China's imports from developing countries due to this accession, where "the noticeable benefit possible for Africa is in the field of agricultural raw materials". On the other side, the negative sign for the case of Brazil is surprising. The special treatment granted by developed countries, as for instance the Generalised System of Preferences (GSP) allowed by the GATT-WTO, is probably the main cause. This favoured status gives to least-developed countries (LDCs) easier access to the markets of developed countries, contrary to some large developing economies such as Brazil (Hawthorne, 2013), leading to a trade deviation effect at the expense of non-member countries.

Fourth, only the case of China is significant when SSA countries are richly endowed in natural resources with a trade-promoting effect. According to Leamer (1984), "the relative abundance of oil leads to net exports of crude oil and coal and mineral abundance leads to net exports of raw materials". This satisfies the growing Chinese demand for natural resources during these past decades to sustain its economic model.

Fifth, an improvement in SSA's terms of trade increases its bilateral exports to India and China, where the highest effect appears for China. Normally, an improvement in the terms of trade should lead to diminished exports because the country loses price competitiveness. The possible explanation could be the fact that African

trade is very concentrated in the natural resources<sup>28</sup> removing the expected fall in exports because the volume effect can offset the price effect. In others words, the increasing demand for raw materials, particularly by China, enhances export earnings and the economic growth of SSA exporters in natural resources, as suggested by Andersen *et al.* (2014).

### 1.4.2 BRICs' exports to SSA

Table 5 states the results concerning bilateral BRICs' exports to SSA. First, we find that an increase in income dissimilarity index leads to a decrease in Russian exports. These results could confirm the finding of Linder that is an intra-sector trade in agriculture.

Second, Brazil, India and China export more to SSA countries having democratic institutions due to the sensitivity to risks and the respect of sovereignty essentially for the first two. The stability and quality of democratic institutions that diminish the risks of transaction costs and ensure market opportunities (Anderson and Marcouiller, 2002 ; Milner and Kubota, 2004) seems to have a boosting effect on bilateral exports. Otherwise, the results are not significant for Russia.

Third, WTO membership has a positive effect on the Indian and Chinese exports to SSA, but negatively for Brazilian exports. Given the exceptions that LDCs were allowed in the GATT regime (the GSP for instance), GATT-WTO membership could even have a negative impact on trade liberalisation and so on trade flows because LDCs can maintain high trade barriers.

Fourth, Brazilian and Indian exports to SSA are higher when SSA countries are

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<sup>28</sup>This result must be viewed with caution because the improvement in the terms of trade does not affect the countries richly endowed in natural resources uniformly (Roache, 2012 ; Villoria, 2012).

Table 1.4: Determinants of SSA's exports to BRICs

	(1)	(2)	(3)
GDP per capita dissimilarity $_{ijt}$	0.11 <sup>b</sup> (0.05)	0.05 (0.04)	0.26 <sup>b</sup> (0.10)
GATT-WTO $_{ijt}$	0.45 <sup>a</sup> (0.04)	0.26 <sup>a</sup> (0.01)	0.70 <sup>a</sup> (0.05)
ln Terms of trade $_{it}$		-0.05 <sup>a</sup> (0.01)	-0.01 (0.02)
Democracy $_{it}$		-0.08 <sup>c</sup> (0.04)	0.08 (0.09)
Resource $_{it}$		1.07 <sup>b</sup> (0.48)	1.5 <sup>a</sup> (0.35)
ln distance $_{ij}$	-1.61 <sup>a</sup> (0.01)		
Language $_{ij}$	0.81 <sup>a</sup> (0.03)		
<b>SSA_BRIC*ln distance</b>			
Brazil	-0.20 <sup>b</sup> (0.08)		
Russia	-0.19 <sup>b</sup> (0.07)		
India	0.06 (0.07)		
China	-0.06 (0.06)		
<b>SSA_BRIC*ln GDP per capita dissimilarity</b>			
Brazil	-0.27 (0.30)	0.33 (0.34)	0.18 <sup>a</sup> (0.05)
Russia	0.83 <sup>b</sup> (0.38)	0.76 <sup>a</sup> (0.25)	0.27 (0.21)
India	-0.10 (0.14)	0.11 (0.09)	0.19 <sup>a</sup> (0.03)
China	-0.13 (0.11)	-0.11 (0.09)	0.08 (0.08)
<b>SSA_BRIC*democracy</b>			
Brazil	-0.15 (0.50)	0.45 (0.36)	-0.33 (0.36)
Russia	-0.07 (0.48)	1.15 <sup>a</sup> (0.38)	1.13 <sup>b</sup> (0.52)
India	-0.33 (0.39)	0.61 (0.45)	0.32 (0.60)
China	-1.23 <sup>a</sup> (0.40)	-0.34 (0.24)	0.48 (0.47)
<b>SSA_BRIC*language</b>			
Brazil	0.83 (1.11)		
Russia			
India	-1.59 <sup>a</sup> (0.51)		
China			
<b>SSA_BRIC*gatt-wto</b>			
Brazil	0.04 (0.50)	-2.24 <sup>a</sup> (0.47)	-1.58 <sup>a</sup> (0.25)
Russia			
India	0.69 <sup>c</sup> (0.36)	0.84 (0.81)	1.56 <sup>b</sup> (0.77)
China	0.99 <sup>b</sup> (0.38)	1.78 <sup>a</sup> (0.25)	1.03 <sup>a</sup> (0.11)
<b>SSA_BRIC*resource</b>			
Brazil	1.14 (0.80)	0.72 (0.61)	-0.24 (1.17)
Russia	0.20 (0.77)	-2.4 <sup>a</sup> (1.02)	-0.88 (1.61)
India	0.42 (0.56)	0.48 (1.02)	-1.13 (1.40)
China	1.41 <sup>a</sup> (0.45)	2.6 <sup>c</sup> (1.57)	2.43 <sup>a</sup> (0.83)
<b>SSA_BRIC*ln terms of trade</b>			
Brazil	0.05 (0.14)	-0.03 (0.08)	0.60 (0.50)
Russia	0.26 <sup>c</sup> (0.14)	0.07 (0.24)	2.56 (2.03)
India	0.09 (0.10)	0.35 <sup>a</sup> (0.09)	1.11 <sup>a</sup> (0.21)
China	0.24 <sup>c</sup> (0.13)	0.26 <sup>a</sup> (0.09)	1.74 <sup>a</sup> (0.31)
Constant	14.46 <sup>a</sup> (0.14)	0.81 <sup>a</sup> (0.02)	
Observations	537642	537642	736564
Country-year fixed effects	Yes	No	No
Country-pair fixed effects	No	Yes	Yes
Time dummies	Yes	Yes	Yes
R <sup>2</sup>	0.72	0.85	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels. Columns (1), (2), (3) respectively represent specifications with monadic fixed effects, dyadic fixed effects, PPML-dyadic fixed effects.

richly endowed in natural resources, whereas findings are not significant for Russia and China. For instance, in the case of Brazil, Angola and Nigeria represent nearly 50% of Brazilian exports to SSA. These countries are also the main SSA oil economies.

Fifth, whatever the BRICs considered (except for Russia), exports to SSA increase when the SSA' terms of trade improve, and the highest effect appears for China. This situation corresponds to an increase in the price-competitiveness of the BRICs' exports relative to SSA. Indeed, the BRICs' export prices appear lower because of the rise of SSA's export prices due to the appreciation of raw materials.

### 1.4.3 Results over specific time period

In order to check the robustness of previous findings, we decide to run our specification over a specific shorter time period, 1991-2012 (Table 9). Indeed, the surge of trade relations between BRICs and SSA essentially appeared over the recent period. These results (Tables 6 and 7) confirm the specificities of trade aspect of BRICs' engagement in Africa previously highlighted even if some changes appear. First, we find evidence that resource-rich partners strongly improve Chinese exports to Africa compared with the other BRICs. These findings clearly show that natural resources contributed significantly to the exploitation of the trade complementarity between these developing economies. Second, the improvement in terms of trade increases SSA exports to Brazil due to the trade concentration with resource-rich African countries. Third, the presence of a democratic system promotes SSA exports to Brazil and India like for the other BRICs, where the stability of institutions seems to be an important determinant for foreign exporters in Africa. Fourth, when the income dissimilarity index increases there is a trade-promoting effect for SSA low income exporters to Russia such as Ethiopia, Liberia, Sudan.

Table 1.5: Determinants of BRICs' exports to SSA

	(1)	(2)	(3)
GDP per capita dissimilarity <sub>ijt</sub>	0.12 <sup>b</sup> (0.05)	0.04 (0.04)	0.24 <sup>b</sup> (0.10)
GATT-WTO <sub>ijt</sub>	0.45 <sup>a</sup> (0.04)	0.27 <sup>a</sup> (0.01)	0.71 <sup>a</sup> (0.05)
ln Terms of trade <sub>it</sub>		0.01 <sup>b</sup> (0.008)	-0.06 <sup>a</sup> (0.01)
Democracy <sub>it</sub>		0.14 <sup>a</sup> (0.03)	0.07 (0.09)
Resource <sub>it</sub>		1.41 <sup>a</sup> (0.21)	1.75 <sup>a</sup> (0.35)
ln distance <sub>ij</sub>	-1.61 <sup>a</sup> (0.01)		
Language <sub>ij</sub>	0.80 <sup>a</sup> (0.03)		
<b>BRIC_SSA*ln distance</b>			
Brazil	-0.12 <sup>a</sup> (0.03)		
Russia	-0.10 <sup>c</sup> (0.05)		
India	0.03 (0.03)		
China	0.10 <sup>a</sup> (0.02)		
<b>BRIC_SSA*ln GDP per capita dissimilarity</b>			
Brazil	-0.12 (0.20)	-0.11 (0.10)	-0.12 (0.15)
Russia	-0.001 (0.21)	-0.28 (0.23)	-0.16 <sup>a</sup> (0.03)
India	-0.03 (0.06)	0.06 (0.07)	-0.02 (0.05)
China	-0.06 (0.05)	-0.01 (0.04)	0.08 (0.05)
<b>BRIC_SSA*democracy</b>			
Brazil	-0.24 (0.21)	-0.07 (0.28)	0.38 <sup>c</sup> (0.22)
Russia	-0.80 <sup>b</sup> (0.37)	0.29 (0.37)	0.27 (0.39)
India	-0.06 (0.19)	0.65 <sup>b</sup> (0.27)	0.84 <sup>a</sup> (0.26)
China	-0.21 (0.26)	0.29 <sup>c</sup> (0.16)	0.55 <sup>c</sup> (0.30)
<b>BRIC_SSA*language</b>			
Brazil	-0.30 (0.51)		
Russia			
India	-0.17 (0.21)		
China			
<b>BRIC_SSA*gatt-wto</b>			
Brazil	0.06 (0.22)	0.23 (0.50)	-0.67 <sup>a</sup> (0.20)
Russia			
India	0.89 <sup>a</sup> (0.22)	1.61 <sup>a</sup> (0.43)	1.28 <sup>b</sup> (0.53)
China	-0.12 (0.20)	1.02 <sup>a</sup> (0.13)	0.71 <sup>a</sup> (0.12)
<b>BRIC_SSA*resource</b>			
Brazil	0.49 <sup>c</sup> (0.27)	1.91 <sup>a</sup> (0.23)	2.87 <sup>a</sup> (0.37)
Russia	-0.03 (0.46)	-2.40 <sup>a</sup> (0.25)	-0.19 (0.36)
India	-0.29 (0.23)	0.94 <sup>a</sup> (0.28)	2.51 <sup>a</sup> (0.40)
China	0.12 (0.23)	0.29 <sup>c</sup> (0.23)	0.12 (0.46)
<b>BRIC_SSA*ln terms of trade</b>			
Brazil	0.05 (0.06)	0.08 <sup>c</sup> (0.04)	0.22 <sup>a</sup> (0.08)
Russia	-0.05 (0.10)	-0.07 (0.10)	0.12 (0.09)
India	0.003 (0.03)	0.15 <sup>a</sup> (0.04)	0.53 <sup>a</sup> (0.16)
China	-0.03 (0.04)	0.12 <sup>a</sup> (0.05)	0.70 <sup>a</sup> (0.23)
Constant	14.45 <sup>a</sup> (0.14)	0.7 <sup>a</sup> (0.01)	
Observations	537642	537642	736564
Country-year fixed effects	Yes	No	No
Country-pair fixed effects	No	Yes	Yes
Time dummies	Yes	Yes	Yes
R <sup>2</sup>	0.72	0.85	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels. Columns (1), (2), (3) respectively represent specifications with monadic fixed effects, dyadic fixed effects, PPML-dyadic fixed effects.

Table 1.6: Determinants of SSA's exports to BRICs over specific time period

	PPML
GDP per capita dissimilarity $_{ijt}$	0.18 (0.14)
GATT-WTO $_{ijt}$	0.67 <sup>a</sup> (0.06)
ln Terms of trade $_{it}$	0.36 <sup>a</sup> (0.08)
Democracy $_{it}$	-0.01 (0.05)
Resource $_{it}$	2.72 <sup>a</sup> (0.28)
<b>SSA_BRIC*ln GDP per capita dissimilarity</b>	
Brazil	0.03 <sup>b</sup> (0.01)
Russia	0.26 (0.21)
India	0.19 <sup>a</sup> (0.02)
China	0.07 (0.08)
<b>SSA_BRIC*democracy</b>	
Brazil	0.74 <sup>b</sup> (0.32)
Russia	1.23 <sup>b</sup> (0.51)
India	1.05 <sup>b</sup> (0.47)
China	1.05 <sup>a</sup> (0.2)
<b>SSA_BRIC*gatt-wto</b>	
Brazil	-1.16 <sup>a</sup> (0.22)
Russia	
India	1.97 <sup>a</sup> (0.75)
China	0.69 <sup>a</sup> (0.12)
<b>SSA_BRIC*resource</b>	
Brazil	0.45 (1.65)
Russia	-1.57 (1.74)
India	1.01 (3.02)
China	1.17 <sup>b</sup> (0.5)
<b>SSA_BRIC*ln terms of trade</b>	
Brazil	0.90 <sup>a</sup> (0.1)
Russia	2.16 (2.03)
India	0.85 <sup>a</sup> (0.30)
China	1.34 <sup>a</sup> (0.24)
Observations	518255
Time period	1991-2012
Country-pair fixed effects	Yes
Time dummies	Yes

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 1.7: Determinants of BRICs' exports to SSA over specific time period

	PPML
GDP per capita dissimilarity <sub>ijt</sub>	0.19 (0.14)
GATT-WTO <sub>ijt</sub>	0.67 <sup>a</sup> (0.06)
ln Terms of trade <sub>it</sub>	0.02 (0.03)
Democracy <sub>it</sub>	0.05 (0.04)
Resource <sub>it</sub>	1.70 <sup>a</sup> (0.32)
<b>BRIC_SSA*ln GDP per capita dissimilarity</b>	
Brazil	-0.04 (0.08)
Russia	-0.16 <sup>a</sup> (0.03)
India	0.01 (0.04)
China	0.09 (0.07)
<b>BRIC_SSA*democracy</b>	
Brazil	0.39 <sup>c</sup> (0.22)
Russia	0.30 (0.39)
India	1.05 <sup>a</sup> (0.24)
China	0.61 <sup>c</sup> (0.35)
<b>BRIC_SSA*gatt-wto</b>	
Brazil	0.13 (0.20)
Russia	
India	0.63 (0.44)
China	0.69 <sup>a</sup> (0.14)
<b>BRIC_SSA*resource</b>	
Brazil	2.45 <sup>a</sup> (0.59)
Russia	-0.19 (0.34)
India	1.65 <sup>a</sup> (0.53)
China	1.24 <sup>b</sup> (0.50)
<b>BRIC_SSA*ln terms of trade</b>	
Brazil	0.56 (0.37)
Russia	0.03 (0.09)
India	0.78 <sup>b</sup> (0.30)
China	0.82 <sup>a</sup> (0.30)
Observations	518255
Time period	1991-2012
Country-pair fixed effects	Yes
Time dummies	Yes

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 1.8: Summary of findings (1980-2012)

Interaction terms	SSA's export to Brazil	SSA's export to Russia	SSA's export to India	SSA's export to China
GDP p.c dissimilarity (-/+)	+	NS	+	NS
democracy (+)	NS	+	NS	NS
GATT-WTO (+)	-	+	+	+
resource (+)	+	-	NS	+
terms of trade (-)	NS	NS	+	+
Interactions terms	Brazilian export to SSA	Russian export to SSA	Indian export to SSA	Chinese export to SSA
GDP p.c dissimilarity (-/+)	NS	-	NS	NS
democracy (+)	+	NS	+	+
GATT-WTO (+)	-	+	+	+
resource (+)	+	NS	+	NS
terms of trade (+)	+	NS	+	+

Note: We essentially report PPML-fixed effects results. Lecture: signs in parentheses are expected signs, +/-/NS respectively mean positive, negative and not significant effects, columns in gray are the highest coefficients.

Table 1.9: Summary of findings (1991-2012)

Interaction terms	SSA's export to Brazil	SSA's export to Russia	SSA's export to India	SSA's export to China
GDP p.c dissimilarity (-/+)	+	+	NS	NS
democracy (+)	+	+	+	+
GATT-WTO (+)	-	+	+	+
resource (+)	NS	NS	NS	+
terms of trade (-)	+	NS	+	+
Interactions terms	Brazilian export to SSA	Russian export to SSA	Indian export to SSA	Chinese export to SSA
GDP p.c dissimilarity (-/+)	NS	-	NS	NS
democracy (+)	+	NS	+	+
GATT-WTO (+)	NS	+	NS	+
resource (+)	+	NS	NS	+
terms of trade (+)	NS	NS	+	+

Note: We essentially report PPML-fixed effects results. Lecture: signs in parentheses are expected signs, +/-/NS respectively mean positive, negative and not significant effects, columns in gray are the highest coefficients.

## 1.5 Conclusion

As suggested by De Grauwe et al. (2012), it would be very interesting to know whether the trade determinants between Africa and China would significantly differ to those relative to other emerging countries. This is the main goal of the present work for the specific case of bilateral trade between SSA and the BRICs. At first, a descriptive analysis allows us to identify three major stylised facts: (i) an increasing weight of the BRICs in the foreign trade of SSA since the beginning of the 2000s to the detriment of European countries; (ii) a double concentration phenomenon in the nature of traded products and the geographic location; (iii) the incontestable leadership of China within the BRICs group. Then, we clearly note a reorientation of African trade even if this South-South trade presents very similar characteristics to those observed in the North-South trade.

Otherwise, the econometric analysis gives one more interesting finding. A strong heterogeneity appears between each BRIC country in the field of trade determinants as bilateral trade flows relative to SSA are concerned. On the one hand, focusing on SSA exports to BRICs, we point out three distinct profiles, namely (i) the Brazilian case influenced positively by income dissimilarity, democracy, WTO membership, natural resources and negatively by terms of trade, (ii) the Russian case associated positively with income dissimilarity and democracy, and (iii) the Indian/Chinese case driven positively by democracy, WTO membership, natural resources (non significant for India) and terms of trade. On the other hand, focusing now on BRICs exports to SSA, we have four main profiles, that is (i) the Brazilian one linked positively with democracy and natural resources, (ii) the Russian one only driven negatively by income dissimilarity, (iii) the Indian one positively impacted by democracy and terms of trade, and (iv) the Chinese one positively determined by all variables

except for income dissimilarity.

To conclude, our findings are in line with the stylised facts characterising the trade between SSA and BRICs, and in particular the heterogeneity phenomenon amongst BRICs. Moreover, China, and to less extent the other BRICs, seem also to maintain the SSA economies in their economic specialisation, with the recurrent problem of the natural resource curse (Arezki and Gylfason, 2013 ; Sala-i-Martin and Subramanian, 2013) due to the prevalence of raw materials in the structure of SSA trade.

Table 1.10: List of SSA countries across World Bank classification (2016)

Countries	Classification	Countries (cont')	Classification (cont')
Angola	Upper middle income	Madagascar	Low income
Benin	Low income	Malawi	Low income
Botswana	Upper middle income	Mali	Low income
Burkina Faso	Low income	Mauritania	Lower middle income
Burundi	Low income	Mauritius	Upper middle income
Cabo Verde	Lower middle income	Mozambique	Low income
Cameroon	Lower middle income	Namibia	Upper middle income
Central African Republic	Low income	Niger	Low income
Chad	Low income	Nigeria	Lower middle income
Comoros	Low income	Rwanda	Low income
Congo, Dem. Rep.	Low income	Sao Tome and Principe	Lower middle income
Congo	Lower middle income	Senegal	Low income
Ivory Coast	Lower middle income	Seychelles	High income
Equatorial Guinea	Upper middle income	Sierra Leone	Low income
Eritrea	Low income	Somalia	Low income
Ethiopia	Low income	South Africa	Upper middle income
Gabon	Upper middle income	Sudan	Lower middle income
Gambia	Low income	Swaziland	Lower middle income
Ghana	Lower middle income	Tanzania	Low income
Guinea	Low income	Togo	Low income
Guinea-Bissau	Low income	Uganda	Low income
Kenya	Lower middle income	Zambia	Lower middle income
Lesotho	Lower middle income	Zimbabwe	Low income
Liberia	Low income		

Note: Brazil, China, Russia are upper middle income countries and India an lower middle income country.

Table 1.11: List of SSA countries according to some interaction variables

Common language (portuguese)	Common language (english)	Resource-rich countries	Democracy
Angola	Botswana	Gabon, Liberia, Mauritania (1960)	Burundi (2005)
Cabo Verde	Cameroon	Sierra Leone, Swaziland, Zambia (1960)	Benin (1991)
Guinea-Bissau	Eritrea	Botswana (1970)	Bostwana (1965)
Mozambique	Ethiopia	Nigeria (1971)	Comoros (2004)
Sao Tome and Principe	Ghana	Angola, Congo, Guinea (1974)	Cabo verde (1991)
	Gambia	Cameroon, Namibia (1979)	Ghana (2001)
	Kenya	Equatorial Guinea (1996)	Kenya (2002)
	Liberia		Liberia (2006)
	Lesotho		Mauritius (1968)
	Mauritius		Namibia (1990)
	Malawi		Senegal (2000)
	Namibia		Sao Tome and Principe, Seychelles, South-Africa (1994)
	Nigeria		Burkina Faso (1978-1979)
	Rwanda		Central African Republic (1993-2002)
	Sierra Leone		Gambia (1965-1993)
	Somalia		Guinea-Bissau (2005-2011)
	Seychelles		Madagascar (1992-2008)
	Tanzania		Mali (1992-2011)
	Uganda		Somalia (1960-1968)
	South-Africa		Uganda (1962-1965)
	Zambia		Lesotho (1966-1969, 1993-1997, 2002)
	Zimbabwe		Malawi (1994-2000, 2004)
			Nigeria (1960-1965, 1979-1983)
			Niger (1992-1995, 2004-2008, 2011)
			Sierra Leone (1961-1966, 2007)
			Sudan (1956-1957, 1965-1968, 1986-1988)
			Zambia (1991-1995, 2008)

Source: See Table 2.

Note: The dates in parentheses mean the beginning or the time period where democratic system is present. About natural resources, the authors classify a country as resource-rich starting in the first year satisfying the conditions previously described.

## Chapter 2

South-South trade and  
geographical diversification of  
intra-SSA trade: Evidence from  
BRICs.

## 2.1 Introduction

“In the case of South-South trade, we see a marked expansionary trend, but one that is rather narrowly based in regional terms. South-South trade clearly holds dynamic potential that could be realized more effectively through further trade liberalization” (World Trade Organisation, 2003). A decade later, this expansionary trend of South-South trade was intensified with the economic awakening of emerging economies like BRICs (Brazil, Russia, India, China). According to the African Development Bank, intra-african trade increased by 50% between 2010 and 2013 mainly sustained by the increasing influence of the BRICs around the world, particularly in least-developed and developing economies such as those found in Africa. “The growth rate of BRIC countries’ trade with Africa has outpaced the average global trade growth and the growth rate of BRIC’s trade with the rest of the world”<sup>1</sup>. In this context, several international organisations recommend to African economies to take advantage of the growing role of emerging countries in order to “diversify their trading partners within and outside the continent” (African Development Bank, 2012). We decide here to empirically investigate this issue by studying to what extent the choice of external trading partners can affect bilateral trade flows and geographical diversification of intra-African trade.

A substantial part of the literature studied the exports diversification of developing countries by paying little attention to the geographical diversification<sup>2</sup> of exports in terms of trading partners. Since the work of Raul Prebisch and Hans Singer in the 1950s, export diversification is a core concern in the trade of developing countries in

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<sup>1</sup><http://www.ictsd.org/bridges-news/bridges-africa/news/a-glance-at-africa%E2%80%99s-engagement-with-the-brics>

<sup>2</sup>There is an increase in trade growth by the creation of trading relations between new partners or the increase in destinations for exporters (Shepherd, 2010).

order to minimise vulnerabilities and diversify sources of economic spillovers. Shepherd (2010) demonstrated some determinants of the geographical diversification of developing country exports such as the reduction of trade costs, the trade facilitation that increase the number of export destinations. Regolo (2013) showed that the diversification of developing country exports is higher for trade between these countries than with developed countries due to the relative similarity of endowments and comparative advantages. Amighini and Sanfilippo (2014) highlighted that importing from developing countries allows the diversification of African exports (by varieties and quality) more than importing from advanced economies, as a result of the low level of technological gap and similar capacities of production. In this chapter, we assess the hypothesis assuming that the BRICs exports to SSA promote intra-SSA trade flows and its trade growth at the geographical extensive margin.

We focus on specific South-South trade relationships which illustrate a growing interest in the literature for the economic links between African and the BRICs countries. Jenkins and Edwards (2006), Kaplinsky and Messner (2008), Giovanetti and Sanfilippo (2009), Montinari and Prodi (2011), He (2013) found an increasing impact of China and India on the trade structure of developing countries due to complementary (trade specialisation) and competitive (low costs products) effects.

Furthermore, with a low level of intra-SSA trade since independence and despite an increasing trend in trade growth since the 1990s, the specialised literature delivers mixed findings without taking into account the geographical diversification of exports. Foroutan and Pritchett (1993), Oramah and Abou-Lehaf (1998), Longo and Sekkat (2004) suggested that the low level of intra-regional trade in Africa can be explained by the lack of economic complementarity between them, the high trade costs with poor infrastructures and also by the slow implementation of regional trade agreements. For Buys et al. (2010), Bosker and Garretsen (2012), the past weak-

nesses have been gradually rectified in recent decades with a decreasing trade cost due to investments in infrastructure and regional trade liberalisation, which stimulate intra-African trade. Nicita and Rollo (2015) show that SSA export growth mainly comes from “the increased value and/or volume of preexisting product-destination flows”.

We therefore examine whether the BRIC exports to African countries affect the bilateral trade flows and the geographical diversification of intra-SSA trade. Based on a worldwide database over the period 1948-2012, we use several specifications of the structural gravity model, which is theory-consistent and robust (Anderson and van Wincoop, 2003 ; Head and Mayer, 2014) with different dependent variables as advised by the literature. Firstly, we examine whether the nature of trading partners affects intra-SSA trade flows using a dependent variable representing the value of bilateral trade flows and by using country-year, country-pair fixed effects (Head and Mayer, 2014) and Poisson pseudo maximum likelihood (PPML) fixed effects (Santos Silva and Tenreyro, 2006 ; Santos Silva and Tenreyro, 2011 ; Fally, 2015) to avoid biased estimates with the presence of zero trade flows in the sample. In order to evaluate the geographical extensive margin of intra-SSA trade growth, we employ two approaches. We used a linear probability model (LPM) including fixed effects with a dependent variable, which is a binary variable for strictly positive export flows (Head et *al.*, 2010). In addition, the dependent variable counts the number of countries to which the exporting country has strictly positive export flows with a PPML-fixed effects estimator (Shepherd, 2010 ; Lavallée and Lochard, 2015).

This chapter is structured as follows. Section 2 describes some stylised facts about South-South trade and geographical trade diversification. We present our motivations and we review the literature in Section 3. Section 4 shows the empirical approaches used. Results are presented in Section 5 and Section 6 concludes.

## 2.2 South-South trade and geographical trade diversification: some stylised facts

### 2.2.1 South-South trade, more than a trend

South-South trade has become an important characteristic of the world economy during the last decades. Indeed, according to the IMF economic outlook<sup>3</sup>, developing countries have a greater growth rate than the global economy, respectively 4.4% and 4.3% for 2014 and 2015 compared with 3.3% and 3.5%. Developing countries realised a trade reorientation due to the displacement of the gravity centre of the world wealth towards emerging countries (Figure 1). “The value of South-South trade has increased from about one-tenth of total trade to some two-fifths. Developing countries share of global exports has jumped from 33 per cent to 43 per cent over the last decade, with China’s exports growing annually at a staggering 20 per cent”<sup>4</sup>.

The upsurge of a group of emerging countries, for example the BRICs, more and more affects the economic pattern of the other countries. Asia represents more than 60% of the South-South trade followed by South-America with more than 10% and Africa with less than 10%. At the same time, intra-SSA trade remains the lowest around the world with 16.6% in 2012 compared to intra-trade in Europe (72%), North-America (48%), Asia (52%), latin-America (26%). This is mainly because of geographical impediments like higher trade costs and a narrow market, even if an increasing trend of intra-trade seems to appear over the last few years. We also know that the BRIC countries, particularly China that is one of the main trading partners in Africa, established strong trade relationships based on an economic complementary

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<sup>3</sup>For advanced economies, the annual growth rates are 1.8% and 2.4% in 2014 and 2015. <http://www.imf.org/external/pubs/ft/weo/2015/update/01/info.htm>

<sup>4</sup>[https://www.wto.org/english/news\\_e/sppl\\_e/sppl239\\_e.htm](https://www.wto.org/english/news_e/sppl_e/sppl239_e.htm)

due to their trade specialisations. According to the UNCTAD (2013), “the growth of the South-South commerce was higher in developing Africa between 1995 and 2012 than in the developing regions of Asia and America. Moreover, South-South trade from least developed countries (LDCs) in Africa climbed significantly [...]. African LDCs have increasingly benefited from commercial exchanges with developing Asia”. Then, it would be interesting to examine to what extent trade relationships with the BRICs can geographically diversify the intra-SSA exports.

### 2.2.2 Geographical trade diversification

According to WTO forecasts<sup>5</sup>, developing economies have been the main drivers of the world trade growth compared to advanced economies for several years. For instance, the rate of merchandise exports growth for developing countries increased to 15% in 2010 against 3.9% in 2013 and 4% in 2014, compared with 13.4%, 1.5%, 2.5% for the same years in developed countries. We focus on the role of geographical diversification in the explanation of trade growth. Figure 2 comes from a World Bank Report edited by Newfarmer *et al.* (2009)<sup>6</sup> and presents the evolution of the origin of trade growth through geographical and product diversification<sup>7</sup> by income group. We see that the number of exported products is higher than the number of trading partners whatever the income group. High-income economies have a higher number of partners and exported products compared to middle and low-income countries over the period 1962-2004. Nevertheless, middle and low-income countries have the fastest growth concerning the number of trading partners unlike high-income economies. Furthermore, this report found that the “increase in exports of existing products to

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<sup>5</sup>[https://www.wto.org/english/news\\_e/pres14\\_e/pr722\\_e.htm](https://www.wto.org/english/news_e/pres14_e/pr722_e.htm)

<sup>6</sup><http://www10.iadb.org/intal/intalcdi/PE/2009/03418.pdf>

<sup>7</sup>Their variables are issued to COMTRADE and based on 3-digit SITC trade data for 180 countries over the period 1962-2004.

existing markets” (intensive margin) and “new exports of existing products to new markets” (geographical extensive margin) mainly contributed to the export growth for 99 developing countries between 1995 and 2004.

The trade reorientation of SSA previously described leads to a diversification of export destinations at the benefit of South-South trade, particularly to China. The erosion of colonial linkages (Head et al., 2010), the sustaining economic expansion of developing countries (Abiad et al., 2015), the increasing trading relationships between China and Africa (He, 2013) and the complementary between them (Kaplinsky and Messner, 2008) have allowed this geographical trade diversification to be sustained. According to Amurgo-Pacheco and Pierola (2008), the SSA growth of trade is mainly explained by the rise of old products<sup>8</sup> to old destinations (intensive margin) but also by the increase of new or old products to new trading partners (geographical extensive margin). Figure 3 clearly shows the growing evolution of (intra-)SSA export destinations. For intra-SSA trade, the number of export destinations has more than doubled from 1948 to 2012. This chapter tries to bring out the evidence that South-South trade promotes geographical trade diversification within intra-SSA trade.

## 2.3 Motivations and review of literature

### 2.3.1 A theoretical explanation of South-South trade

Greenaway and Milner (1990) focus on the sources of South-South trade in order to attempt to deliver a consistent framework. First, South-South trade can be

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<sup>8</sup>“We have defined old products as all products that were exported at least three years before 1995, consecutively or not. Likewise, new products have been defined as those products that have been exported for at least five times after 1995”.

sustained through dissimilarity and inter-industry specialisation founded not only on comparative advantages with technological and relative production differences among countries but also on the factorial endowments. Jenkins and Edwards (2006), Kaplinsky and Messner (2008), He (2013) show that “Asian drivers” (China, India) have the capacity to influence the SSA trade patterns through the trade channel from a complementary effect, the growth of exports markets and terms of trade. Second, Linder assumptions (McPherson *et al.*, 2001) and the new trade theory justify the existence of trade between countries having the same level of development and similar specialisations which lead to scale economies, increasing returns and products differentiation. In other words, this kind of trade is based on similarity between trading partners and intra-industry specialisation. Third, for Otsubo (1998), the increasing of South-South trade improves the benefits of learning “by operating in a less competitive market environment and generating economies of scale that are necessary to break into the North’s markets for more technologically advanced products”. Market access abroad is a strong factor which helps to geographically diversify the trade. Fugazza and Robert-Nicoud (2006), Fugazza and Vanzetti (2008) suppose that South-South trade allows exporters in those countries to serve more outside markets due to cheaper price of intermediate inputs and the implementation of trade liberalisation. For instance, lower trade hindrances in South-South trade bring the fall of prices for intermediate inputs and exporters of final goods are able to cover the cost of exporting on foreign markets.

### 2.3.2 South-South trade and trade diversification

Trade growth can be explained through several dimensions<sup>9</sup>, for example, intensive margin, product extensive margin and geographical extensive margin. The economic literature has mostly studied the first two margins, although studies have gradually appeared about the third. Indeed, the determinants of trade growth have drawn more and more attention from researchers focusing on the diversification issue, either by products and/or by trading partners.

Shepherd (2010) contributed to fill the literature void with an empirical work on the geographical extensive margin. More precisely, he assesses the impact of determinants of trade growth explained by the geographical trade diversification. He finds significant evidence that a decrease in trade costs increases the number of export destinations for developing countries whereas the effect is reverse for the market size and the level of development of domestic market. For instance, a decrease of 10% in trade costs leads to an increase of 5-6% in the number of export destinations for developing countries. Since the Uruguay round during the GATT, tariffs in developing countries have diminished to one-third over the last two decades, that is 14.67% in 1996 and 8.46% in 2006 on average<sup>10</sup> for South-South trade. For Albornoz *et al.* (2012), trade agreements and exchange with neighbouring countries are necessary conditions which allow the improvement in trade diversification at the extensive margin to test “new” products to these destinations before to provide the outside markets in the case of uncertain trade gains. Regolo (2013) showed that trade between partners having similar endowments and a same level of development drastically improves more bi-

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<sup>9</sup>According to Amurgo-Pacheco and Pierola (2008), trade growth comes from the increase in trade with former trading partners without new products (intensive margin), with old/new partners and new products (product extensive margin) and with new partners and old/new products (geographical extensive margin).

<sup>10</sup>[http://www.cepii.fr/PDF\\_PUB/wp/2013/wp2013-36.pdf](http://www.cepii.fr/PDF_PUB/wp/2013/wp2013-36.pdf)

lateral trade than between dissimilar economies. These findings sustain the idea that trade between developing countries is higher than trade between developing and developed countries. Moreover, the author emphasised the positive effect of decreasing trade costs in order to promote export diversification across products. Amighini and Sanfilippo (2014) studied the effects of the upsurge of the SS integration through trade and foreign direct investment (FDI). They estimated export performance of African countries with the index of export diversification of Herfindahl and by the unit value of exports. Their economic intuition stipulates that African countries that import from developing countries increases their capacity to extend the variety of manufactured exports by incorporating more developed products for weakly diversified economies. An upgrading effect appears for African exports, which is higher when goods are imported from developing countries than from developed economies. Several reasons can explain these findings. First, the complementary effect between developing countries which improves productivity gains due to the incorporation of imported inputs and encourages the rise of inputs available for exporters. Second, the technology transfer is better accessible for these economies because of the relative similarity of technology and the level of development which allows enhancing the learning potential.

## 2.4 Methodological approach and structural gravity model

### 2.4.1 Data

We use a worldwide database<sup>11</sup> over the period 1948-2012 with more than 1.3 million observations. This database includes the traditional variables in a gravity model like GDP, GDP per capita, geographical distance, shared language, contiguity, former colonisers, trade agreements<sup>12</sup>. Our dependent variable is the value in million dollars of bilateral exports ( $X_{ijt}$ ) constructed by DOTS (IMF) and complemented by COMTRADE.

### 2.4.2 Empirical specifications and estimation issues

To investigate the effects of South-South through the BRIC countries on the geographical diversification of intra-SSA exports, we apply a structural gravity model from three complementary approaches. First of all, the gravity equation shows the positive and proportional effect of economic size of trading partners on bilateral trade but also the reverse effect of trade costs for example geographical distance. More specifically, the gravity model mainly admits two sets of explanatory variables: (i) monadic or unilateral variables which vary or not in time for origin and destination countries; (ii) dyadic or bilateral variables constants or which vary in time. For several decades, there have been a many theoretical foundations about the gravity model. Indeed, the contribution of Tinbergen (1962) has been progres-

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<sup>11</sup>See the website of Keith Head: <http://strategy.sauder.ubc.ca/head/sup/>

<sup>12</sup>For more details about the data origin see the appendix of Head et al. (2010): <http://strategy.sauder.ubc.ca/head/Papers/erosion.pdf>.

sively improved by integrating more and more microeconomic elements and the new international trade theory framework<sup>13</sup>.

Equation 1 shows the economic intuition derived from Newton's law with the positive and proportional effect of economic size of trading partners ( $Y_i$ ,  $E_j$ ) on bilateral trade ( $X_{ij}$ ), the reverse effect of trade costs ( $\tau_{ij}$ ) like geographical distance and trade costs across the other export and import markets through relative price effects ( $P_i$ ,  $P_j$ ). Indeed, based on Armington hypotheses about specialisation, identical constant elasticity of substitution ( $\sigma$ ) and the theoretical-consistent background developed by Anderson and van Wincoop (2003), we sum up this theoretical gravity equation:

$$X_{ij} = \left( \frac{Y_i E_j}{Y_w} \right) \left( \frac{\tau_{ij}}{P_i P_j} \right)^{1-\sigma} \quad (2.1)$$

From a structural gravity model, we account for multilateral resistance demonstrated by Anderson and van Wincoop (2003) through fixed effects<sup>14</sup> (country-year and country-pair). This empirical method is the most used by the literature (Head and Mayer, 2014) and also solves the endogeneity issue. One of the recurrent issues in the gravity model is the presence of zero trade flows where the PPML estimator is the most appropriated compared to the other standard methods (Santos Silva and Tenreyro, 2006 ; Santos Silva and Tenreyro, 2011 ; Head and Mayer, 2014 ; Fally, 2015). We divide our approach into three parts with robust standard errors clustered by country-pair.

First, the dependent variable is based on the value of bilateral exports (Equations 2 and 3). We wish to empirically estimate whether the BRICs exports to SSA affect intra-SSA trade flows. The variable of interest equals 1 if  $i$  and  $j$  are SSA trading

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<sup>13</sup>See Head and Mayer (2014) for have more details and references.

<sup>14</sup>In order to capture other trade costs across the other export and import markets through relative price effects.

partners for each year since Brazil, Russia, India and China export to  $i$  countries, 0 otherwise.

Second, we decide to estimate the marginal effect of South-South trade on geographical extensive margin through a LPM. The dependent variable is a binary variable for strictly positive export flows which takes 1 in this case, 0 otherwise (Head *et al.*, 2010), and with the same variable of interest described above (Equations 4 and 5). More precisely, we see the likelihood of realising positive trade flows with SSA countries when these are a destination of the BRIC exports. In other words, we rely and extend the economic intuition of Amighini and Sanfilippo (2014) where African imports from developing countries enhance the diversification of African bilateral trade flows. We use LPM, which is implemented by robust ordinary least squares (OLS) with fixed effects instead of probit and logit as advised by Angrist and Pischke (2009). An increase in the probability of strictly positive export flows signifies a rise of new trading partners applied to intra-SSA exports due to the BRIC exports to SSA.

Third, we assess the impact of South-South trade on the geographical extensive margin of trade by using PPML with country-pair fixed effects. The dependent variable is the total number of countries to which a given country has nonzero exports for each year (Shepherd, 2010 ; Lavallée and Lochard, 2015) and with the same variable of interest (Equation 6). This method introduced by Shepherd (2010) allows us to better investigate the geographical export diversification through the number of export markets and in our case for intra-SSA trade.

Accordingly, our different specifications of gravity equation are as follows:

$$\ln X_{ijt} = \beta_0 + \beta_1 \ln M_{i(j)t} + \beta_2 \mathbf{D}_{ijt} + \beta_3 SST_{ijt} + \gamma_{ij} + \lambda_t + \epsilon_{ijt} \quad (2.2)$$

$$\ln X_{ijt} = \beta_0 + \beta_1 \mathbf{D}_{ijt} + \beta_2 \mathbf{F}_{ij} + \beta_2 SST_{ijt} + \gamma_{it} + \gamma_{jt} + \epsilon_{ijt} \quad (2.3)$$

$$x_{ijt} = \beta_0 + \beta_1 \ln \mathbf{M}_{i(j)t} + \beta_2 \mathbf{D}_{ijt} + \beta_2 SST_{ijt} + \gamma_{ij} + \lambda_t + \epsilon_{ijt} \quad (2.4)$$

$$x_{ijt} = \beta_0 + \beta_1 \mathbf{D}_{ijt} + \beta_2 \mathbf{F}_{ij} + \beta_2 SST_{ijt} + \gamma_{it} + \gamma_{jt} + \epsilon_{ijt} \quad (2.5)$$

$$nb\_x_{ijt} = \beta_0 + \beta_1 \ln \mathbf{M}_{i(j)t} + \beta_2 \mathbf{D}_{ijt} + \beta_2 SST_{ijt} + \gamma_{ij} + \lambda_t + \epsilon_{ijt} \quad (2.6)$$

where  $X_{ijt}$  is country  $i$  exports to  $j$  at year  $t$ ,  $x_{ijt}$  is a binary variable taking the value 1 for strictly positive export flows ( $X_{ijt} > 0$ ), 0 otherwise.  $nb\_x_{ijt}$  is the number of countries to which the exporting country has strictly positive export flows ( $X_{ijt} > 0$ ).  $F_{ij}$  represents time-fixed dyadic variables like geographical distance, shared language, contiguity.  $M_{i(j)t}$  regroups time-varying monadic variables like GDP and population.  $D_{ijt}$  are time-varying dyadic variables like FTAs, GATT-WTO. Our variable of interest is  $SST_{ijt}$  as previously described. Equations 3 and 5 include country-year fixed-effects ( $\gamma_{i(j)t}$ ). Equations 2, 4 and 6 have country-pair fixed effects ( $\gamma_{ij}$ ) and time dummies ( $\lambda_t$ ) as advised by Baldwin and Taglioni (2006) and Head and Mayer (2014).

## 2.5 Estimation results

### 2.5.1 BRICs effects on intra-SSA trade

We report the results for the BRICs effects on intra-SSA exports in Table 1. We privilege the results with PPML-fixed effects for the reasons previously described in order to take into account the main econometric issues of these empirical trade models. We first look at the results for the control variables which have the expected signs. For instance, the more the economic size (GDP) of exporting countries in-

creases, the more bilateral exports also increase. Geographical distance remains a strong hindrance to trade unlike shared common language and contiguity.

We interpret one by one the coefficients of our variable of interest. When Brazil exports to SSA, SSA intra-trade is not affected. Intra-SSA trade is 1.71 ( $\exp(0.54)$ ) times higher when Russia exports to SSA than with other countries, the same results appear for the other BRIC countries even if their magnitudes are different. Intra-SSA trade is 1.37 ( $\exp(0.32)$ ) times higher when India exports to SSA than with other countries. Intra-SSA trade is 1.64 ( $\exp(0.50)$ ) times higher when China exports to SSA than with other countries. We find that Russian and Chinese exports to SSA have greater impacts on intra-SSA trade compared with the other BRICs over the studied period.

More precisely, the economic weight of China in the world economy, particularly in the value chains but also its growing presence in Africa can explain the magnitude of the economic influence of China on the African trade patterns unlike the other BRIC countries. We here suppose that a complementary effect between these developing countries improve intra-SSA trade. Jenkins and Edwards (2006) explain that increased imports from China allow a better purchasing power for local consumers and producers with cheaper inputs for the latter by encouraging the reduction of production costs and costs of entry in foreign markets.

Table 2 details these coefficients over specific time periods (1948-1969, 1970-1990, 1991-2012). We observe that results confirm that Chinese exports to SSA have the strongest effect on intra-SSA trade flows whatever the studied period, whereas the findings are only significant for the recent period for the other BRIC countries.

### 2.5.2 BRICs effects on the geographical diversification of intra-SSA trade: a linear probability model

Results for the impact of the BRICs on the geographical extensive margin of intra-SSA trade from a LPM are presented in Table 3. We here assess the likelihood of SSA countries realising positive trade with other SSA countries when BRIC countries export to SSA. When Brazil exports to SSA, a decrease appears in the probability of strictly positive export flows between SSA countries of about 9.5 percentage points. A reverse effect is present when Russia exports to SSA with an increase in the probability of strictly positive export flows between SSA countries of about 2 percentage points. This is also true for Indian exports to SSA with an increase in the probability of strictly positive exports flows between SSA countries of about 10.5 percentage points. Chinese exports to SSA increase the probability of strictly positive export flows between SSA countries of about 18.5 percentage points.

A relative homogeneity across the BRIC economies appears by supporting the geographical export diversification within the intra-SSA trade even if the “Asian drivers” drastically improve the probability of having new SSA trading partners. We see an increase in the probability of positive trade flows due to Chinese exports to SSA on intra-SSA exports, which is greater than the other BRIC countries, but closely followed by India. In other words, the more China exports to SSA, the higher is the probability of increasing the number of SSA export destinations for SSA exporters. These results sustain the economic intuition of Amighini and Sanfilippo (2014) where trade between developing countries is an important determinant of African trade growth. Indeed, Shepherd (2010) underlines that trade liberalisation of developing countries through the reduction of trade costs (tariffs, transport, transaction) during these last few years has allowed improved export diversification of these economies.

Table 4 presents estimates when we break down our sample in three time periods. Findings always emphasise the evidence that Chinese exports to SSA allow an increase in the probability that export flows are strictly positive for intra-SSA exports, whereas the results are more mixed for Brazil, Russia and India. For instance, with LPM country-year fixed effects specification, we show that Brazilian exports to SSA do not improve the geographical extensive margin of intra-SSA exports for 1948-1969 and 1970-1990, but very weakly for Russia over the period 1991-2012.

### **2.5.3 BRICs effects on the geographical diversification of intra-SSA trade: number of export destinations**

Table 5 shows results for the BRICs effects on the geographical export diversification of intra-SSA trade with the number of export destinations from PPML-fixed effects. All coefficients are positive and significant whatever the emerging trading partners of SSA. Indeed, we see that when each BRIC countries export to SSA, the number of SSA export destinations respectively increase on average by 80%, 9%, 76% and 131%. The evidence of geographical diversification of intra-zone exports for SSA also seem to appear with this empirical approach due to trade channels mainly driven by these emerging economies during these last years.

Chinese exports to SSA have the highest effect on the number of destinations for intra-SSA exports compared with the other BRICs. The more China exports to SSA, the more the number of SSA export destinations increases in the intra-SSA trade. According to Gao et al. (2014), China's export growth is principally explained by the quantity of growth (around 70%) between 1995-2010 stimulated by the lowering of prices which facilitate the absorption of imported inputs by SSA exporters. For Caporale et al. (2015) the Chinese trade structure shifted to cap-

ital and technological-intensive exports. Indeed, by investigating the Chinese case with their Asian, European and North-American trading partners, the authors find a development of intra-industry trade between the latter where China mainly differentiates their products by prices. The Chinese trade positioning in a relative similar specialisation, notably in some manufactured products with competitive prices, can lead to a diminution of entry costs in export markets.

For specific time periods (Table 6), the results support the previous findings where Brazilian and Indian exports to SSA allow the increase in the number of new trading partners in intra-SSA trade during the first two sub-periods. Moreover, China globally has the greatest impact on the geographical diversification of intra-SSA exports whatever the period.

## 2.6 Conclusion

Trade opportunities of South-South trade for SSA economies have been the subject of a WTO forum in 2014<sup>15</sup> by underlining the growing importance of the development of relations between developing countries. Several factors have encouraged the trade reorientation of developing economies, particularly for SSA since the end of 1990s. According to Amighini and Sanfilippo (2014), “importing from other developing countries has the strongest impact on export diversification compared to import from developed countries”, essentially at the level of product diversification. We therefore investigate the geographical dimension (trading partners) of diversification of intra-SSA trade in the case of trading relationships between the BRICs and SSA countries. First, when China exports to SSA, we find that intra-SSA trade increases by 64% over the studied period. Second, results suggest that the probabil-

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<sup>15</sup>[https://www.wto.org/english/forums\\_e/public\\_forum14\\_e/pf14wks\\_e/ws39\\_e.htm](https://www.wto.org/english/forums_e/public_forum14_e/pf14wks_e/ws39_e.htm)

ity of strictly positive exports for intra-SSA exports increases when BRIC countries export to SSA, i.e. between 10% and 18%. Third, we find evidence of a geographical diversification of intra-SSA trade when China exports to SSA where the number of export destinations within Africa is twice higher compared to the other BRICs. This is notably due to a complementary of trade pattern, an upgrading effect, a learning effect by technological transfer, a decreasing in trade costs recently impulsed by developing countries but also a re-export phenomenon by SSA economies. Concerning the effects over time (1948-1969, 1970-1990, 1991-2012), the estimates strongly sustain the previous evidence with the significant effect of the BRIC exports to SSA on the geographical diversification of intra-SSA trade even if the magnitude and the signs differ between them. In addition, the specific role of China is confirmed.

Finally, this chapter empirically attempts to confirm that “increasing trade links with China have allowed SSA countries to diversify their export destinations away from advanced economies” (Drummond and Liu, 2015), specifically within the SSA region. However, a thorough analysis should be undertaken in order to sustain these findings.

Table 2.1: BRICs effect on intra-SSA trade

	OLS	MFE	DFE	MFE&DFE	PPML
<i>ln GDP<sub>it</sub></i>	0.78 <sup>a</sup>		0.73 <sup>a</sup>		0.72 <sup>a</sup>
	(0.007)		(0.01)		(0.03)
<i>ln GDP<sub>jt</sub></i>	0.59 <sup>a</sup>		0.64 <sup>a</sup>		0.61 <sup>a</sup>
	(0.007)		(0.01)		(0.02)
<i>ln Population<sub>it</sub></i>	0.14 <sup>a</sup>		-0.47 <sup>a</sup>		-0.39 <sup>a</sup>
	(0.009)		(0.04)		(0.09)
<i>ln Population<sub>jt</sub></i>	0.19 <sup>a</sup>		0.39 <sup>a</sup>		-0.18
	(0.009)		(0.03)		(0.07)
<i>ln Distance<sub>ij</sub></i>	-1.08 <sup>a</sup>	-1.27 <sup>a</sup>			
	(0.01)	(0.01)			
<i>Contiguity<sub>ij</sub></i>	0.69 <sup>a</sup>	0.52 <sup>a</sup>			
	(0.06)	(0.07)			
<i>Common language<sub>ij</sub></i>	0.73 <sup>a</sup>	0.73 <sup>a</sup>			
	(0.03)	(0.03)			
<i>FTA<sub>ijt</sub></i>	0.95 <sup>a</sup>	0.52 <sup>a</sup>	0.51 <sup>a</sup>	0.39 <sup>a</sup>	0.31 <sup>a</sup>
	(0.04)	(0.04)	(0.02)	(0.02)	(0.03)
<i>GATT-WTO<sub>ijt</sub></i>	-0.04 <sup>c</sup>	0.35 <sup>a</sup>	0.19 <sup>a</sup>	0.14 <sup>a</sup>	0.34 <sup>a</sup>
	(0.02)	(0.03)	(0.01)	(0.02)	(0.04)
<b>Effect on intra-SSA trade</b>					
<i>Brazilian exports to SSA<sub>ijt</sub></i>	0.11	-0.12	-0.88 <sup>a</sup>	-0.20	-0.51
	(0.34)	(0.30)	(0.29)	(0.24)	(0.33)
<i>Russian exports to SSA<sub>ijt</sub></i>	-1.06 <sup>a</sup>	0.64 <sup>a</sup>	0.12 <sup>b</sup>	0.56 <sup>a</sup>	0.54 <sup>a</sup>
	(0.06)	(0.07)	(0.06)	(0.06)	(0.09)
<i>Indian exports to SSA<sub>ijt</sub></i>	-0.41	-0.19	0.13	0.11	0.32 <sup>a</sup>
	(0.26)	(0.20)	(0.19)	(0.16)	(0.11)
<i>Chinese exports to SSA<sub>ijt</sub></i>	-0.68 <sup>a</sup>	0.07	0.76 <sup>a</sup>	0.51 <sup>a</sup>	0.50 <sup>b</sup>
	(0.33)	(0.28)	(0.23)	(0.16)	(0.21)
<i>Constant</i>	-23.18 <sup>a</sup>	11.31 <sup>a</sup>	-31.65 <sup>a</sup>	0.51 <sup>a</sup>	
	(0.25)	(0.14)	(0.52)	(0.01)	
Observations	624449	699603	624449	699603	930950
Country-year fixed effects	No	Yes	No	Yes	No
Country-pair fixed effects	No	No	Yes	Yes	Yes
Time dummies	No	Yes	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.52	0.70	0.83	0.85	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 2.2: BRICs effect on intra-SSA trade over time period

	PPML	PPML	PPML
$\ln GDP_{it}$	0.57 <sup>a</sup> (0.08)	0.58 <sup>a</sup> (0.03)	0.56 <sup>a</sup> (0.04)
$\ln GDP_{jt}$	0.43 <sup>a</sup> (0.06)	0.47 <sup>a</sup> (0.03)	0.61 <sup>a</sup> (0.04)
$\ln Population_{it}$	-0.73 <sup>a</sup> (0.17)	-0.86 <sup>a</sup> (0.10)	0.004 (0.16)
$\ln Population_{jt}$	-0.58 <sup>a</sup> (0.15)	-0.29 <sup>a</sup> (0.09)	-0.62 <sup>a</sup> (0.15)
$\ln Distance_{ij}$			
$Contiguity_{ij}$			
$Common\ language_{ij}$			
$FTA_{ijt}$	0.35 <sup>a</sup> (0.06)	0.11 <sup>a</sup> (0.04)	0.13 <sup>a</sup> (0.04)
$GATT-WTO_{ijt}$	0.07 <sup>b</sup> (0.03)	0.22 <sup>a</sup> (0.04)	0.27 <sup>a</sup> (0.05)
<b>Effect on intra-SSA trade</b>			
$Brazilian\ exports\ to\ SSA_{ijt}$	0.12 (0.41)	0.17 (0.30)	0.94 <sup>b</sup> (0.43)
$Russian\ exports\ to\ SSA_{ijt}$			0.32 <sup>a</sup> (0.08)
$Indian\ exports\ to\ SSA_{ijt}$	-0.14 (0.30)	0.07 (0.15)	-0.61 <sup>a</sup> (0.10)
$Chinese\ exports\ to\ SSA_{ijt}$	1.03 <sup>a</sup> (0.33)	0.61 <sup>a</sup> (0.18)	0.55 <sup>a</sup> (0.17)
Observations	124736	340897	386882
Time period	1948-1969	1970-1990	1991-2012
Country-year fixed effects	No	No	No
Country-pair fixed effects	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 2.3: BRICs effect on the probability of positive export flows

	LPM	LPM
$\ln GDP_{it}$		0.009 <sup>a</sup> (0.002)
$\ln GDP_{jt}$		0.04 <sup>a</sup> (0.002)
$\ln Population_{it}$		0.17 <sup>a</sup> (0.007)
$\ln Population_{jt}$		0.08 <sup>a</sup> (0.006)
$\ln Distance_{ij}$	-0.13 <sup>a</sup> (0.02)	
$Contiguity_{ij}$	0.01 (0.01)	
$Common\ language_{ij}$	0.10 <sup>a</sup> (0.003)	
$FTA_{ijt}$	-0.16 <sup>a</sup> (0.009)	-0.11 <sup>a</sup> (0.004)
$GATT-WTO_{ijt}$	-0.006 (0.004)	0.05 <sup>a</sup> (0.002)
<b>Effect on intra-SSA trade</b>		
$Brazilian\ exports\ to\ SSA_{ijt}$	-0.11 <sup>a</sup> (0.02)	-0.10 <sup>a</sup> (0.02)
$Russian\ exports\ to\ SSA_{ijt}$	0.02 <sup>a</sup> (0.009)	0.02 <sup>b</sup> (0.008)
$Indian\ exports\ to\ SSA_{ijt}$	0.03 <sup>c</sup> (0.01)	0.10 <sup>a</sup> (0.01)
$Chinese\ exports\ to\ SSA_{ijt}$	0.10 <sup>a</sup> (0.02)	0.17 <sup>a</sup> (0.02)
$Constant$	1.74 <sup>a</sup> (0.01)	-1.08 <sup>a</sup> (0.07)
Observations	1191050	957590
Country-year fixed effects	Yes	No
Country-pair fixed effects	No	Yes
Time dummies	Yes	Yes
$R^2$	0.51	0.57

Note: The dependent variable is a binary variable for exports flows strictly positive.  
 Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup>  
 respectively significance at the 1%, 5% and 10% levels.

Table 2.4: BRICs effect on the probability of positive export flows over time period

	LPM	LPM	LPM	LPM	LPM	LPM
<i>ln GDP<sub>it</sub></i>				-0.007 (0.006)	0.02 <sup>a</sup> (0.003)	0.02 <sup>a</sup> (0.03)
<i>ln GDP<sub>jt</sub></i>				0.004 (0.004)	0.05 <sup>a</sup> (0.003)	0.05 <sup>a</sup> (0.003)
<i>ln Population<sub>it</sub></i>				0.11 <sup>a</sup> (0.02)	0.12 <sup>a</sup> (0.01)	0.15 <sup>a</sup> (0.01)
<i>ln Population<sub>jt</sub></i>				0.003 (0.02)	-0.01 <sup>c</sup> (0.01)	0.08 <sup>a</sup> (0.01)
<i>ln Distance<sub>ij</sub></i>	-0.12 <sup>a</sup> (0.003)	-0.15 <sup>a</sup> (0.002)	-0.11 <sup>a</sup> (0.002)			
<i>Contiguity<sub>ij</sub></i>	0.08 <sup>a</sup> (0.01)	0.004 (0.01)	-0.02 (0.01)			
<i>Common language<sub>ij</sub></i>	0.10 <sup>a</sup> (0.005)	0.12 <sup>a</sup> (0.004)	0.09 <sup>a</sup> (0.004)			
<i>FTA<sub>ijt</sub></i>	-0.18 <sup>a</sup> (0.03)	-0.24 <sup>a</sup> (0.01)	-0.11 <sup>a</sup> (0.007)	-0.03 <sup>b</sup> (0.01)	-0.02 <sup>a</sup> (0.007)	-0.03 <sup>a</sup> (0.003)
<i>GATT-WTO<sub>ijt</sub></i>	0.01 <sup>c</sup> (0.007)	-0.03 <sup>a</sup> (0.006)	0.008 (0.006)	0.01 <sup>a</sup> (0.004)	0.04 <sup>a</sup> (0.005)	0.04 <sup>a</sup> (0.003)
<b>Effect on intra-SSA trade</b>						
<i>Brazilian exports to SSA<sub>ijt</sub></i>	-0.08 <sup>b</sup> (0.03)	-0.14 <sup>a</sup> (0.03)	0.01 (0.04)	-0.12 <sup>a</sup> (0.03)	0.13 <sup>a</sup> (0.03)	-0.003 (0.03)
<i>Russian exports to SSA<sub>ijt</sub></i>			0.02 <sup>b</sup> (0.01)			0.04 <sup>a</sup> (0.01)
<i>Indian exports to SSA<sub>ijt</sub></i>	0.04 (0.02)	0.02 (0.02)	-0.002 (0.05)	0.08 <sup>a</sup> (0.02)	0.11 <sup>a</sup> (0.02)	-0.08 (0.05)
<i>Chinese exports to SSA<sub>ijt</sub></i>	0.01 (0.04)	0.15 <sup>a</sup> (0.03)	0.02 (0.05)	0.18 <sup>a</sup> (0.04)	0.07 <sup>a</sup> (0.02)	0.29 <sup>a</sup> (0.05)
<i>Constant</i>	1.44 <sup>a</sup> (0.02)	1.96 <sup>a</sup> (0.02)	1.72 <sup>a</sup> (0.02)	0.36 <sup>c</sup> (0.19)	-1.42 <sup>a</sup> (0.10)	-1.51 <sup>a</sup> (0.12)
Observations	308427	420720	461903	168745	372465	416380
Time period	1948-1969	1970-1990	1991-2012	1948-1969	1970-1990	1991-2012
Country-year fixed effects	Yes	Yes	Yes	No	No	No
Country-pair fixed effects	No	No	No	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.58	0.47	0.42			

Note: The dependent variable is a binary variable for exports flows strictly positive. Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 2.5: BRICs effect on the number of export destinations

	PPML
$\ln GDP_{it}$	-0.02 <sup>a</sup> (0.004)
$\ln GDP_{jt}$	0.03 <sup>a</sup> (0.004)
$\ln Population_{it}$	0.80 <sup>a</sup> (0.01)
$\ln Population_{jt}$	0.14 <sup>a</sup> (0.01)
$\ln Distance_{ij}$	
$Contiguity_{ij}$	
$Common\ language_{ij}$	
$FTA_{ijt}$	-0.09 <sup>a</sup> (0.006)
$GATT-WTO_{ijt}$	0.10 <sup>a</sup> (0.004)
<b>Effect on intra-SSA trade</b>	
$Brazilian\ exports\ to\ SSA_{ijt}$	0.59 <sup>a</sup> (0.16)
$Russian\ exports\ to\ SSA_{ijt}$	0.09 <sup>a</sup> (0.01)
$Indian\ exports\ to\ SSA_{ijt}$	0.57 <sup>a</sup> (0.10)
$Chinese\ exports\ to\ SSA_{ijt}$	0.84 <sup>a</sup> (0.09)
Observations	930950
Country-pair fixed effects	Yes
Time dummies	Yes

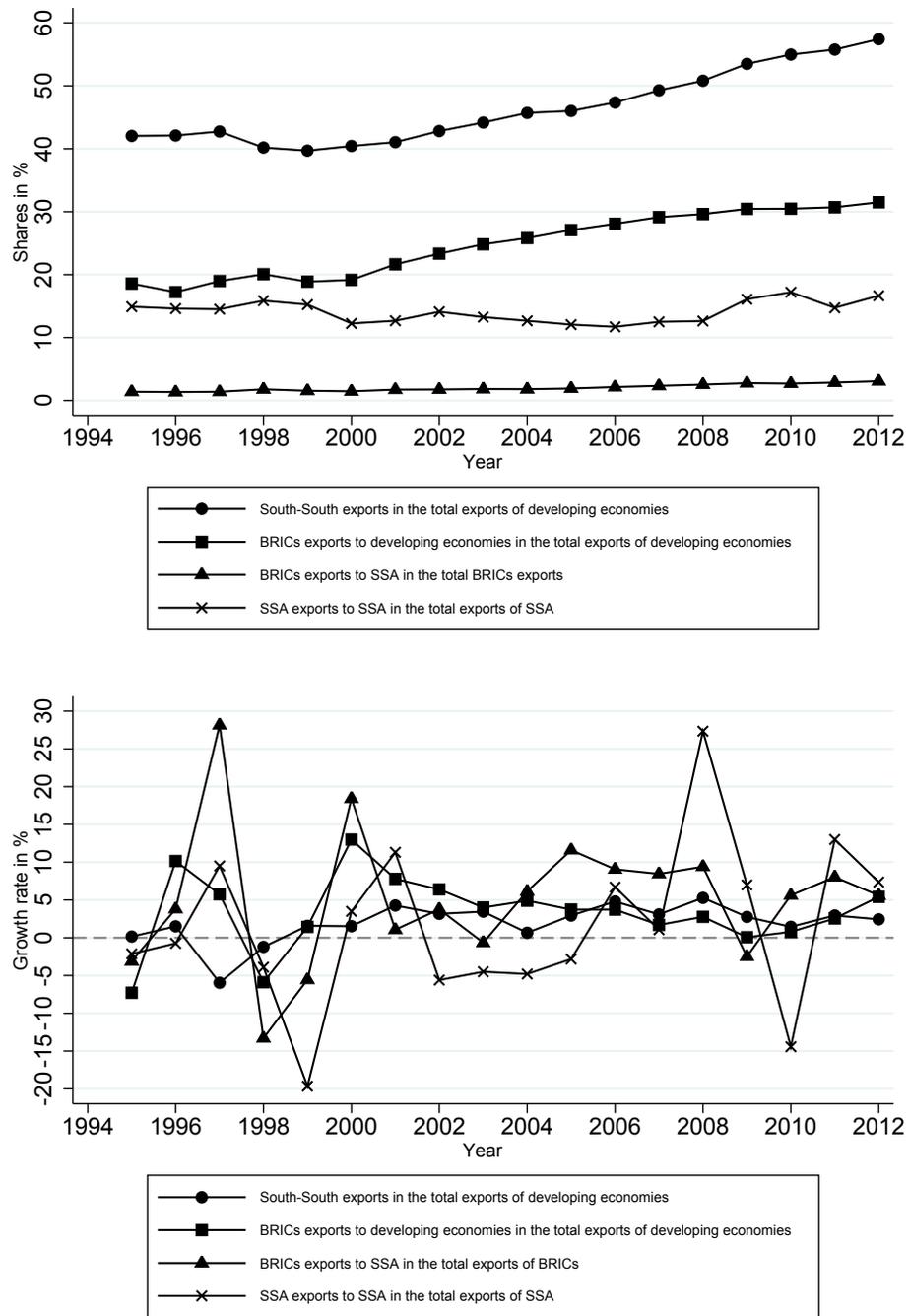
Note: The dependent variable is the total number of destinations for exports flows strictly positive. Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 2.6: BRICs effect on the number of export destinations over time period

	PPML	PPML	PPML
$\ln GDP_{it}$	-0.05 <sup>a</sup> (0.01)	0.02 <sup>a</sup> (0.005)	0.06 <sup>a</sup> (0.005)
$\ln GDP_{jt}$	-0.03 <sup>a</sup> (0.01)	0.05 <sup>a</sup> (0.004)	0.04 <sup>a</sup> (0.005)
$\ln Population_{it}$	0.50 <sup>a</sup> (0.05)	0.47 <sup>a</sup> (0.02)	0.66 <sup>a</sup> (0.02)
$\ln Population_{jt}$	0.21 <sup>a</sup> (0.03)	0.05 <sup>a</sup> (0.01)	0.06 <sup>a</sup> (0.02)
$\ln Distance_{ij}$			
$Contiguity_{ij}$			
$Common\ language_{ij}$			
$FTA_{ijt}$	-0.02 <sup>b</sup> (0.01)	-0.04 <sup>a</sup> (0.005)	-0.03 <sup>a</sup> (0.004)
$GATT-WTO_{ijt}$	0.02 <sup>a</sup> (0.008)	0.05 <sup>a</sup> (0.007)	0.09 <sup>a</sup> (0.004)
<b>Effect on intra-SSA trade</b>			
$Brazilian\ exports\ to\ SSA_{ijt}$	0.96 <sup>a</sup> (0.25)	1.19 <sup>a</sup> (0.15)	0.07 (0.10)
$Russian\ exports\ to\ SSA_{ijt}$			0.25 <sup>a</sup> (0.02)
$Indian\ exports\ to\ SSA_{ijt}$	0.27 <sup>c</sup> (0.15)	0.59 <sup>a</sup> (0.10)	-0.11 (0.15)
$Chinese\ exports\ to\ SSA_{ijt}$	1.10 <sup>a</sup> (0.15)	0.53 <sup>a</sup> (0.10)	0.80 <sup>a</sup> (0.10)
Observations	124736	340897	386882
Time period	1948-1969	1970-1990	1991-2012
Country-pair fixed effects	No	No	No
Country-pair fixed effects	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes

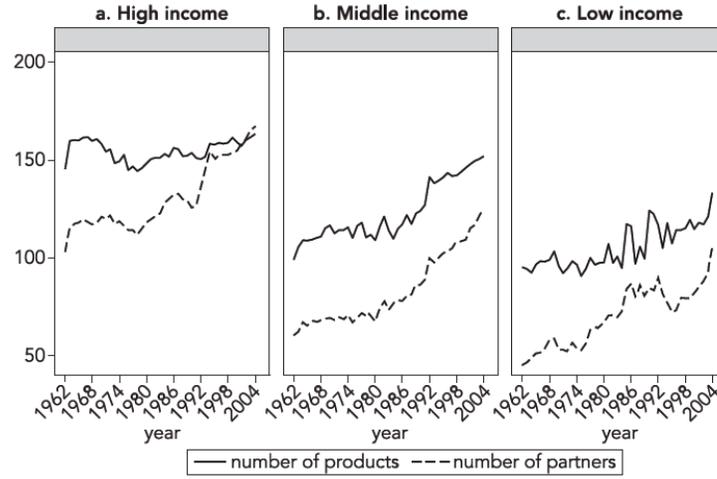
Note: The dependent variable is the total number of destinations for exports flows strictly positive. Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Figure 2.1: An overview of South-South trade



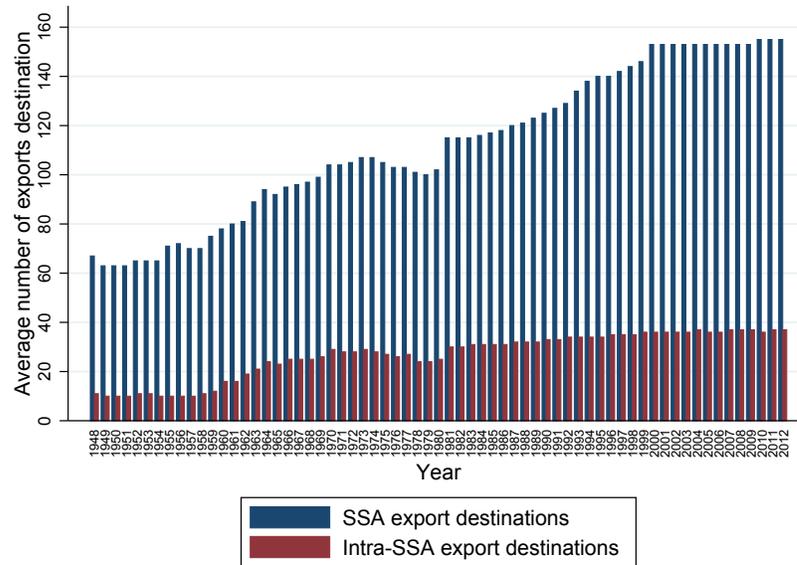
Source: UNCTAD, author calculations.

Figure 2.2: Geographical and product diversification by income group (1962-2004)



Source: Newfarmer et al., 2009.

Figure 2.3: Geographical diversification of SSA exports destination



Source: Author's calculations.

## Chapter 3

# Trade between China and former colonies: the “shifting trade”?<sup>1</sup>

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<sup>1</sup>This chapter corresponds to the paper “Has China replaced colonial trade?” written with Pamina Koenig.

### 3.1 Introduction

“Is China becoming Africa’s new colonial master?” The title of this BBC’s article<sup>2</sup> in July 2012 is representative of an important questioning on the role of China’s exports, imports and investment with Africa, and more generally with former colonies. Translated in academic terms, it suggests that the preferential access to colonial markets has shifted from the hegemon to China. The simplest way to illustrate this claim is to look at the evolution of former colonies’ trade with China and its colonizer since independence. Figure 1 takes the examples of Algeria, Senegal and Ghana and indeed shows an impressive catch-up of China.

However, we will show in this paper that this simple evidence is indeed too simple and its interpretation as a shift in trade costs preferences is deceptive.

We know from the existing literature that trade between the former colonies and their previous colonizer declined from independence on<sup>3</sup>. Regarding trade with the rest of the world, Head *et al.* (2010) estimate a 20 to 30% negative impact of yearly post-independence dummies for former colony-RoW trade, and argue that former colonies did not redirect trade towards rest-of-world countries. Lavallée and Lochard (2015), in a gravity estimation based on country pair fixed-effects, find a positive and significant coefficient on the post-independence-RoW dummy<sup>4</sup>.

In this paper, we explore the possible reorientation of former colonies’ trade

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<sup>2</sup><http://www.bbc.com/news/world-asia-18901656>

<sup>3</sup>Head *et al.* (2010) show that trade with the metropole decreases steadily and stabilizes at 65% of the colonial trade level after four decades of independence. Lavallée and Lochard (2015) find that independence effects on trade vary across empires and are mainly driven by French colonies.

<sup>4</sup>Both papers interpret estimates as the positive effect of separation on trade flows with the rest of the world. Note however that estimates of both papers are the trade impact of a former colony-RoW dummy, which assumes a change in the former colony-RoW trade cost. On the contrary, a reorientation of trade as predicted by the gravity equation is entirely driven by the change in trade costs between former colonies and their metropole, and channeled on trade flows with third countries through multilateral resistance.

towards one specific country, China. China is under special attention since its important surge in international trade flows. In the public debate China is accused of overwhelming rest-of-the-world countries with trade flows. With former colonies, the issue is even stronger, given the fact that these countries have come out, in the second half of the twentieth century, of special trade relationships with their former colonizer. China is indeed suspected of taking over the special trade relation that these countries shared with the colonizer.

We study these patterns using micro-founded gravity equations. This framework contains three channels through which the pattern observed in figure 1 could emerge. The first channel lies in the different growth rates experienced by China versus France and Great-Britain over that period. The second channel implies that formal or informal preferential relations<sup>5</sup> have been developed between China and independent countries leading to the upward time-variation in their trade flows. Third, because of the increased trade cost with the colonizer, ex-colonies should reallocate their trade patterns in favor of all other countries in the world, including China (this channel operates through “multilateral resistance” terms in the gravity equation).

We investigate each channel in turn, with the gravity equation as a benchmark for expected trade levels. First, we complement figure 1 with graphical representations of bilateral trade patterns with China accounting for the main determinants of the gravity equation. The observed catch-up in figure 1 seems to be very well explained by the comparative evolution of production, and export capacities, of the hegemon

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<sup>5</sup>Formal trade relations implies signing preferential trade agreements, which China did not do until the very end of our sample: the China-ASEAN FTA implemented in 2010. The only earlier FTA signed by China with a former colony that we consider is with Pakistan and entered into force in 2008.

Informal trade relations can originate in existing geographical or cultural proximity (see Chaney (2014), Rauch (2001) and Berthou and Erhart (2014) among others). They can also be the result of export and import decisions taken by State-owned firms.

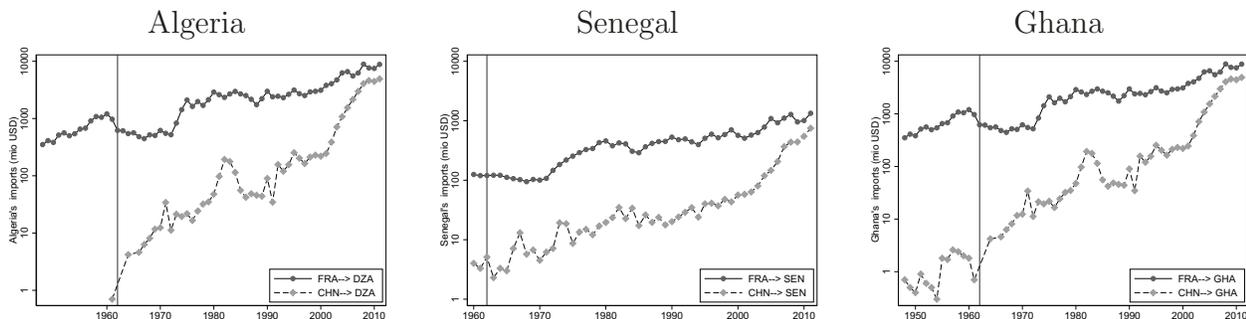
and China.

We then turn to regression analysis in order to further investigate the existence of “excess trade” between ex-colonies and China following independence. We do so using estimates of a structural gravity equation on worldwide bilateral trade flows. When controlling for unilateral and bilateral unobserved determinants of trade, we fail to find any statistically significant effect of the colonies-China pair in the years following independence. In other words, the evolution of trade that colonized countries have with China during the second half of the nineteenth century is fully explained by the usual gravity determinants.

Last, we quantify the third channel of increased dependence of ex-colonies on trade with China. Independence of those countries raised their trade costs with the hegemon. The gravity model of trade predicts that such an increase will redirect trade towards all other partners. We simulate the model with two different scenarios. In the first scenario, each ex-colony gets its independence in the actual historical date, and we calculate the bilateral trade matrix predicted by gravity, given the evolution of incomes and trade costs. In the second scenario, we cancel independence events and recalculate the predicted trade flows. The difference between the two simulations provides a measure of how much trade was redirected because of independence. Our results reveal that independence increased trade with China by 15 % (in 2010) compared to a scenario where those countries would have stayed colonies.

The remainder of the paper is structured as follows. Section 2 presents the data on worldwide trade flows and independence events. Section 3 graphs and estimates the (absence of) specificity of Chinese trade flows with former colonies following independence. In section 4 we compute the counterfactual trade of ex-colonies with China, had the former countries not become independent. Section 5 concludes.

Figure 3.1: Imports from colonizer and from China



## 3.2 Data

To estimate whether China's trade with formerly colonized countries shows unexpected trends or level, we primarily use the dataset made available by Head *et al.* (2010). They compile in particular data on countries' trade flows during the second half of the nineteenth century up to the beginning of the first part of the years 2000, and data on independence years, for all metropolises. After listing the data sources, we illustrate graphically the trade flows that are of interest for us, hence former colonies's trade with their metropole before and after independence, and the same countries with China.

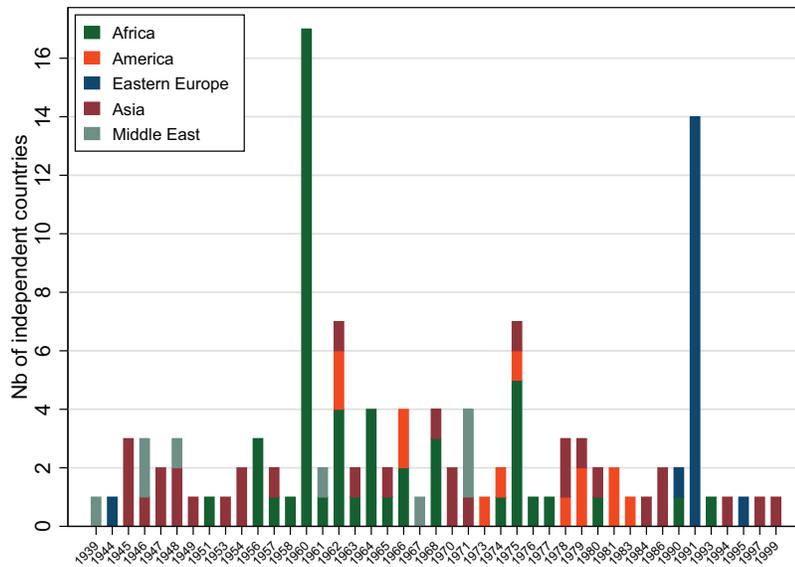
### 3.2.1 Independence and definition of colonies

Information on the independence dates of countries come from the CIA World Factbook. The raw data extracted by Head *et al.* (2010) contains the name of countries which have been colonized, the name of the colonizer, and the date of independence. We proceed to two adjustments with respect to the original independence data. First, we retain only the latest independence date for the countries that have been colo-

nized by different colonizers. This allows to keep the date at which sovereignty was effectively achieved. Mauritius, for example, became independent from France in 1810, however it became fully independent in 1968 from the UK. Dropping early independence dates reduces the number of country pairs with colonial histories from 249 to 194, and shifts the beginning of the database from 1710 (when Estonia ceased to be part of Sweden) to 1804 (independence of Hati from France).

Still, the data comprises independence dates in the eighteenth and nineteenth centuries. Our investigation of Chinese commercial relations with former-colonies concentrates on the second part of the nineteenth century, i.e. on countries which gained sovereignty after 1939. This allows to retain the recent transformations of the Chinese economy, and also to let aside the independence dates of the eighteenth and early nineteenth century, whose nature largely differ from the post-WWII context. The first countries to become independent after this date are Eritrea in 1941 from Italy, then Lebanon from France in 1943, Iceland from Denmark in 1944, and the Japanese colonies at the end of WWII (Koreas and Taiwan). We retain 152 separations that take place between 1939 and 1999, which is the latest recorded date. The end of the Russian Federation in 1991 and five more isolated returns to sovereignty (Eritrea 1993, Palau 1994, Bosnia-Herzegovina 1995, Hong-Kong 1997 and Macau 1999) are the last events before the end of the century. Figure 2 displays the number of countries that became independent over the years, with mention of their region. Immediately apparent is the high concentration of events in the early 1960s (most French colonies of Western Africa went independent in 1960). Other large spikes are the ones linked to the regime changes in Portugal in 1975, and in Russia in 1991. This offer a very wide variety of events, newly independent countries being located in all parts of the world, and recovering governance of their trade policy in quite different time periods.

Figure 3.2: Independent countries per year and world region



### 3.2.2 Trade data

The trade data comes from the International Monetary Funds Direction of Trade Statistics (DOTS). It provides aggregate trade flows between countries from 1948 to 2011, covering the majority of the post-war separation events and also the entry of China in the WTO in 2001. The original DOTS database is compiled by Head *et al.* (2010) until 2006 and complemented with gravity control variables (GDPs, populations, RTAs, currency unions, and distance), as explained in Appendix A of their paper. We extend the data to the most recent years.

## 3.3 Is there something special with China?

Using bilateral trade data going back to 1948, we investigate the presence of specific patterns in the evolution of imports from China, for colonies throughout the world which became independent after 1939. We start with a simple graphical analysis for a set of countries that became independent at the start of the period. Our second exercise turns to regressions and estimates the effect of independence on the level of bilateral trade flows between China and former colonies.

### 3.3.1 Graphical evolution of bilateral trade flows

The graphical analysis presented in figures 1 and 3 provides a first glance at the evolution of China’s trade patterns with ex-colonies. We choose several examples of former colonies and graph their trade flows both with their former colonizer and with China. The cases of these three ex-colonies, Algeria, Senegal and Ghana, share the advantage of having available data for most years in the sample. Algeria became independent in 1962 after several years of violent military conflict, when Senegal’s

separation from the same hegemon (France) was peaceful. Ghana is an example of independence from the United Kingdom.

Let us start with the example of Algeria (first line, three top boxes). The first graph shows the evolution through time of Algerias' shares of total imports from France and from China. The share of imports from France decreases sharply, from more than 55% in 1950 to around 20% in 2010. The share of imports from China, instead, rises steadily, and almost catches up with the French market share at the end of the sample. The evolution is very similar for Senegal, and lines even cross for Ghana, where China is now a larger source of imports than the United Kingdom. This pattern of gradual replacement of the former colonizer by China is quite striking and calls for an investigation of its determinants.

It is useful at this stage to use the gravity equation to guide the next steps of our analysis. We refer here to the simplest version of gravity, which is the most easy to represent graphically (the theory-grounded version of gravity will be used in the next sections). The so-called “naive” gravity equation describes bilateral trade from  $i$  to  $n$ ,  $X_{ni}$ , as a function of the two countries' sizes and bilateral easiness to trade. Measuring bilateral accessibility with  $0 \leq \phi_{ni} \leq 1$ , and GDP with  $Y$ :

$$X_{ni} = GY_i Y_n \phi_{ni}. \quad (3.1)$$

The graphs in the first column of figure 3 plots the import share, which, using naive gravity means

$$\frac{X_{ni}}{\sum_{i \neq n} X_{ni}} = \frac{Y_i \phi_{ni}}{\sum_{i \neq n} Y_i \phi_{ni}}.$$

This equation highlights the straightforward dependence of this import ratio on the size of the origin country  $i$  (here France and China). This is not very informative as

a measure of what we want to capture, i.e. a potential change of trade costs between ex-colonies and China. A more useful measure should take into account the size of the origin country as a potential supplier. We thus divide the import share by the share of the origin country in world GDP ( $Y_i/Y_w$ ):

$$\frac{\frac{X_{ni}}{\sum_{i \neq n} X_{ni}}}{Y_i/Y_w} = \frac{\phi_{ni}}{\sum_{i \neq n} (Y_i/Y_w)\phi_{ni}}. \quad (3.2)$$

The resulting expression, graphed in the second column of figure 3, is proportional to the level of bilateral trade costs between the two countries, compared to the weighted average of trade costs from all other partners. When bilateral accessibility is equal to the average, the ratio of shares is equal to 1. This normalization is represented by the horizontal lines in the second column of figure 3.

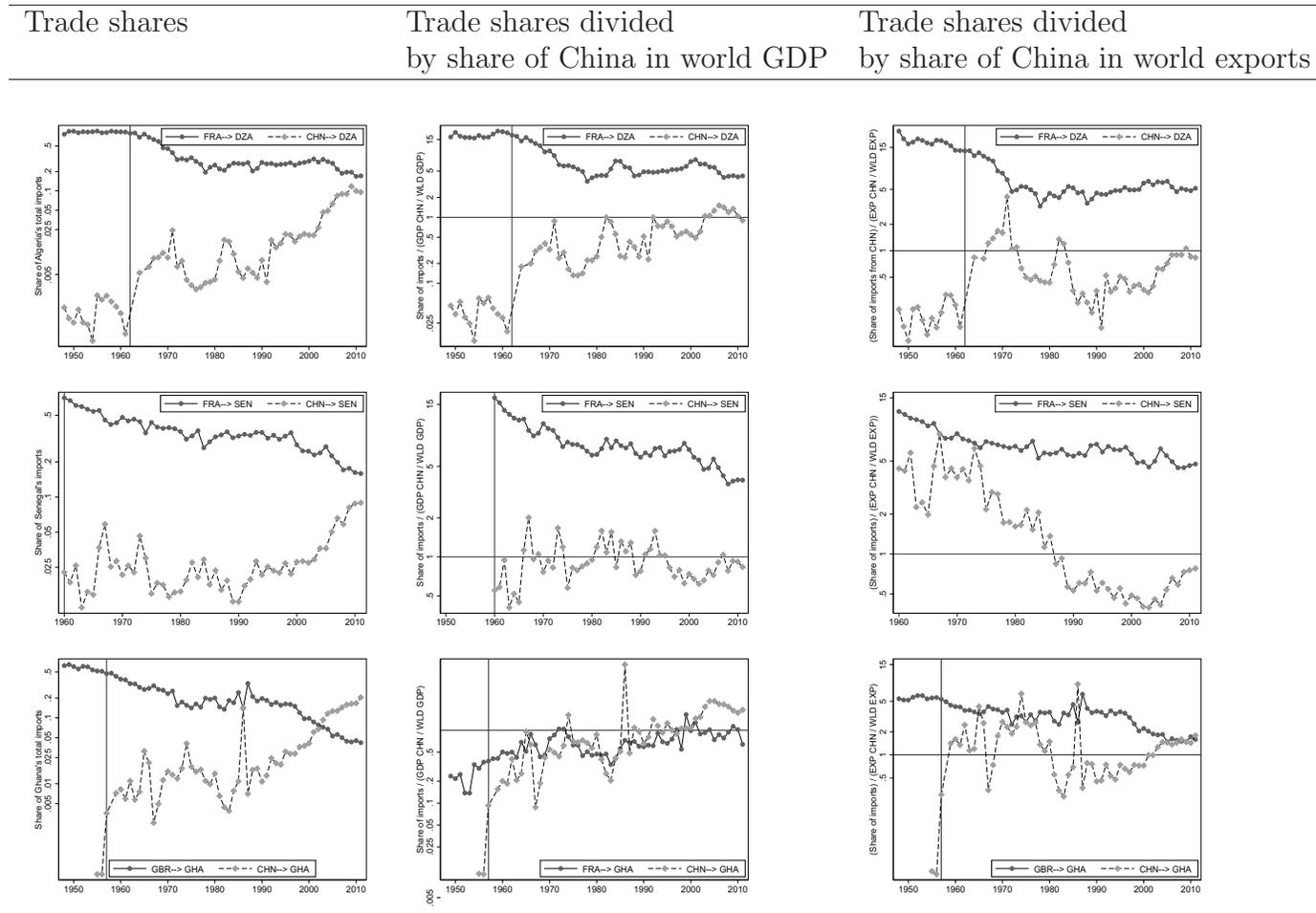
Dividing by the exporter’s share in world production brings noticeable changes to the graph. In particular, the increase in the share of imports from China is much softened compared to the first column, for the three countries. For Algeria and Senegal, the change is quite evident: the share of trade from China increase during the first decade after independence up to the point where trade flows are relatively close to the norm represented by a line equal to 1. The picture is more involved for Ghana, where the change is mostly apparent at the end of the period. Accounting for the growth rates in China’s GDP attenuates the spectacular increase in trade flows displayed for Ghanaean imports from China shown in the first column.

At this point, according to equation 2, an upward trend in the shares of imports from China in column 2 indicate a decrease of the colonie’s bilateral trade costs with China, relative to its average trade cost among all trade partners. Since this is exactly what these graphs aim to capture, a last robustness check can be useful to investigate whether the observed trends do indicate a change in trade preferences for ex-colonies

and China. The developments of the gravity equation literature since Anderson and van Wincoop (2003) emphasize the need for “multilateral resistance” (MR) terms as determinants of trade flows. These variables account for all potential supply sources for the importing country (the inward MR term), and for all possible destinations for the exporter (the outward MR term). Graphically, those can be approximated by dividing import shares by the share of the exporting country in world exports, rather than in world GDP. This is done in column 3 for Algeria, Senegal and Ghana, which displays the share of the ex-colonie’s imports from the former metropole and from China, divided respectively by France’s (or Great-Britain’s) and China’s share in world exports. The effect of dividing by countries’ share in world exports is apparent for the three examples of countries. Importantly, the remaining upward trend in trade shares disappears for two out of the three countries (Algeria and Senegal), shedding doubt or a least opening the investigation about the replacement of colonizer’s trade flows by imports from China.

Looking back on the different representations of trade flows between former-colonies and China, a clear pattern emerges. Adding controls for gravity determinants through changes in the graphed variable diminishes the impression that those ex-colonies replaced the colonial power with China. The graphs contained in the third column are clearly preferable in terms of consistence with theory, and do not exhibit the catch-up pattern that was so apparent in figure 1. We now proceed to proper gravity estimations to investigate more rigorously the same question: whether China’s trade flows to former colonies exhibit abnormal patterns, once controlling for the outward orientation of the Chinese economy.

Figure 3.3: Algeria, Senegal and Ghana's trade with colonizer and with China



The first column contains annual import shares from France and China (line 1), Senegal (line 2) and Ghana (line 3), for Ghana and China. The second columns keeps the same countries and divides the import shares by the share of France, Ghana or China in world GDP. The last column divides the import shares by the share of France, Ghana or China in world exports.

### 3.3.2 Gravity estimation of post-independence trade flows with China

Structural gravity refers to trade models in which bilateral trade determinants enter multiplicatively the trade equation and contain the following terms:

$$X_{nit} = \frac{Y_{it}}{\Omega_{it}} \frac{X_{nt}}{\Phi_{nt}} \phi_{nit}, \quad (3.3)$$

with  $Y_i = \sum_n X_{ni}$  the value of total production,  $X_n = \sum_i X_{ni}$  the value of the importer's total expenditure, and  $\Omega_{it}$  and  $\Phi_{nt}$  the multilateral resistance terms defined as

$$\Phi_n = \sum_l \frac{\phi_{nl} Y_l}{\Omega_l} \quad \text{and} \quad \Omega_i = \sum_l \frac{\phi_{li} X_l}{\Phi_l}. \quad (3.4)$$

In equation 3, bilateral trade  $X_{ni}$  is a function of supply, demand, and bilateral frictions. Compared to the naive gravity equation 1, the supplier term in the structural gravity equation  $S_{it} = \frac{Y_{it}}{\Omega_{it}}$  weights total production  $Y_{it}$  by the exporter's multilateral resistance  $\Omega_{it}$ , and the demand term  $M_{nt} = \frac{X_{nt}}{\Phi_{nt}}$  weights total expenditure  $X_n$  by the importer's multilateral resistance  $\Phi_n$ .

One of the important application of the gravity model is to estimate the effect of bilateral trade determinants. Most trade models express bilateral accessibility through  $0 < \phi_{ni} = \tau_{ni}^\theta < 1$ , in which  $\theta$  is the elasticity of trade flows to trade costs, and trade costs  $\tau_{ni}$  contain the bilateral elements defining the level of frictions to trade between the two partners. Among which geographical distance, common language, shared border, currency, and common history. A joint colonial past is typically included as a trade cost determinant, affecting trade flows through higher bilateral accessibility generated by common institutions and easier communications. The gravity model may thus be used to estimate the effect of colonial history on

trade flows for given country pairs. One obtains the Partial Trade Impact (PTI), as labelled by Head and Mayer (2014), of the trade cost change associated with either colonisation or independence. According to the structural gravity equation, it is the direct effect on ex-colonies and colonizers’ bilateral trade flows of the change in accessibility generated by the restoral of trade barriers, in the case of independence<sup>6</sup>.

While the partial trade impact of independence on colonies-metropole trade is known (Head et al., 2010 ; Lavallée and Lochard, 2015), we investigate the existence of a partial trade impact of Chinese trade preferences with former colonies, subsequently to the independence of each country. If China and former colonies developed formal or informal preferential trade channels following independence, it means that part of the bilateral trade costs between these pairs decreased, making trade flows easier. We can evaluate whether such a decrease happened by estimating a structural gravity equation and by adding indicator variables for trade flows between China and former colonies next to the traditional elements of trade costs.

We follow standard gravity estimation procedures and take logs of equation 3, which gives:

$$\ln X_{nit} = \ln S_{it} + \ln M_{nt} + \ln \phi_{nit}. \quad (3.5)$$

Bilateral trade costs comprise observed time-fixed and time-varying variables and unobserved bilateral trade cost determinants:  $\ln \phi_{nit} = B_{ij} + B_{ijt} + \epsilon_{nit}$ . Traditional gravity variables include geographical distance  $D_{ij}$ , and dummies for the following situations: shared border, common language, trade agreements (RTA, GATT, ACP)

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<sup>6</sup>The gravity equation also predicts an indirect effect of trade costs on third-countries trade flows. In our case this means the impact on ex-colonies trade flows with China, among others, of the trade preferences change with ex colonizers following independence. We investigate this indirect channel in the last section.

and shared currency:

$$B_{ni} = \ln D_{ni} + \text{Border}_{ni} + \text{Lang}_{ij} + \text{ColHist}_{ij} + \text{StillCol}_{ni} + \text{ChnCol}_{ni} + \text{ChnStillCol}_{ni} \quad (3.6)$$

$$B_{nit} = \text{RTA}_{nit} + \text{GATT}_{nit} + \text{Curr}_{nit} + \text{ACPEU}_{nit} + \text{IndYr}_{nit} + \text{IndYrChn}_{nit} \quad (3.7)$$

Our interest lies in the evolution of trade flows between former colonies and China in the years subsequent to their independence. We now explain how we allow the effect to vary year by year. Following Head et al. (2010), we measure the existence of a colony-China trade specificity with dummy variables that each correspond to a given number of years since the independence of the former colony,  $\text{IndYr1Chn}_{nit}$  to  $\text{IndYr65Chn}_{nit}$ .

The benchmark to which each year dummy is compared is the average trade level between colonies and China during colonial time, captured by the dummy variable  $\text{ChnCol}_{ni}$ . It is set to one for all trade flows between colonized countries and China, in both directions. Trade of pairs of countries outside of our interest group are controlled for by suitable variables:  $\text{ChnStillCol}_{ni}$  controls for trade flows between China and ongoing colonies such as Guadeloupe (FR), Aruba (NL) or Falkland Islands (GBR). Dyadic variables include the independence variables used in Head et al. (2010) so as to take into account the decreasing effect of separation on bilateral trade between colonies and metropolises. The  $\text{IndYr1}_{nit}$  to  $\text{IndYr65}_{nit}$  bilateral dummies measure the number of years since independence, for all colonies in the sample, and are defined for flows between former colonies and their former colonial power. Parallel to the Chinese dummies, the benchmark trade level during colonial time for the pair is given by a country-pair variable,  $\text{ColHist}_{ni}$ , which turns on for pairs ever in a colonial relationship.  $\text{StillCol}_{ni}$  sets on for ongoing colonial relationships at the end of the

database (2011). Yearly independence dummies for former colonies thus compute the effect of time with respect to the level during colonial time.

### 3.3.3 Estimation issues

The concern about controlling for supply and demand characteristics, highlighted in the graphical illustration of trade flows, is naturally also part of the gravity estimation strategy. Estimating trade effects of bilateral determinants requires to account for the time-varying supply, demand, and alternative destinations or sources of supply (MR terms). Following common practice in theory-consistent gravity estimation, we control for these variables by using country-time fixed effects  $F_{it}$  and  $F_{nt}$  which capture the monadic terms  $\ln S_{it}$  and  $\ln M_{nt}$ . The unilateral time-varying determinants of trade, population and GDP per capita, drop in specifications using country-time fixed-effects.

We add country pair dummies  $F_{ni}$  to our preferred specification, in order to control for potentially omitted bilateral variables that might correlate with the consequences of independence and are constant through time (long-run historical relationships, etc.). The China-colonies indicator variables are therefore identified through their change over time. With those country-time fixed-effects and dyadic dummies, our estimated equation writes:

$$\ln X_{nit} = a + F_{it} + F_{nt} + F_{ni} + \mathbf{b}B_{nit} + \epsilon_{nit}, \quad (3.8)$$

where  $\epsilon_{nit}$  captures the unobserved factors that influence bilateral trade between the country pair, in addition to the vector of observed trade costs  $B_{nit}$  and to the set of fixed-effects. Our estimations identify China-former colonies specificities in the time-dimension: the timing of independence was “decided” between the hegemon and the

colonized country, which makes its exogeneity a quite reasonable assumption<sup>7</sup>.

The second methodological point consists in dealing with zero trade flows. It has become standard practice to keep the zeroes in bilateral trade regressions through the use of PPML. This econometric estimator was promoted by Santos Silva and Tenreyro (2006) to account for heteroskedasticity. Its use of the level of trade flow (rather than log of trade flows) as a left-hand side variable also permits to keep the zeroes in regressions. We report estimates of equation 8 with the Poisson PMLE to check for robustness to this specification. Computational constraints impede the simultaneous use of dyadic and country-year fixed-effects, we therefore present regressions with Poisson and dyadic dummies in parallel to the OLS specification with the same controls.

Last, we investigate the determinants of former colonies initiating to trade with China during the post-independence period. We investigate whether more years of independence impact significantly the probability to have positive trade flows within these country pairs. We therefore estimate the specification with a linear probability model with the dependent variable being a binary indicator for positive flows.

### 3.3.4 Gravity controls results

We estimate a gravity equation on trade flows from all countries, between 1948 and 2011. Results for the unilateral and bilateral control variables figure in Table 1, and partial trade effects for China-former colonies pairs are graphed in figure 4, in six panels which correspond to the six specifications used.

Monadic determinants are captured by population and GDP per capita in the

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<sup>7</sup>China was a very small actor in international trade in the 1950s and 1960s when most independence events took place, which makes it very unlikely that ex-colonies decided to separate from their metropole because of expected higher trade with China

benchmark specification in column 1, which uses OLS and time dummies, as the gravity equation was originally estimated. Fixed-effects are introduced sequentially in columns 2 (dyadic) and 4 (country-time), and used together in column 5. Unilateral as well as time-fixed bilateral determinants are captured by these fixed-effects in column 5 and the remaining variability is through time for a given country pair. Standard errors in each column are clustered by dyad. Robustness checks based using Poisson estimator with dyadic figure in columns 3, and linear probability model with both sets of fixed-effects on positive flows in the last column.

The first specification shows that increases in GDP per capita and in population affect positively trade flows both for the importer and the exporter with coefficients close to 1 as expected. The time-invariant bilateral variables impact trade in the same way as in the typical gravity literature: the elasticity of trade to distance is negative and very close to -1, and sharing a border and a language both increase trade flows. Policy time-varying determinants such as trade agreements and GATT also increase trade as usually found in the literature.

The time-invariant China-colony dummy sets the benchmark to which the China-colony effects are compared to. It turns on for all flows between China and colonies. Since post-independence trade between China and a former colony is captured by the yearly dummies,  $ChnCol_{ni}$  measures the trade level before separation up to the first year of independence. Its coefficient switches sign and degree of significance between columns (1) and (4), and is non-significant in the latter, suggesting that former colonies' trade flows with China are not significantly different from their trade relations with other partners, besides the metropole, before independence.  $ChnStillCol_{ni}$  adds to  $ChnCol_{ni}$  to measure trade flows between China and ongoing colonies throughout the period. Its negative and significant coefficient indicates that in average, trade flows between colonized countries and China are less-than-

Table 3.1: Gravity regressions control variables

Dep. var.	(1)	(2)	(3)	(4)	(5)	(6)
Method	ln(flow)	ln(flow)	flow	ln(flow)	ln(flow)	0/1
	OLS	OLS	PPML	OLS	OLS	OLS
ln Pop <sub>it</sub>	1.013 <sup>a</sup> (0.006)	0.356 <sup>a</sup> (0.041)	0.525 <sup>a</sup> (0.080)			
ln Pop <sub>nt</sub>	0.845 <sup>a</sup> (0.006)	1.002 <sup>a</sup> (0.037)	0.539 <sup>a</sup> (0.071)			
ln (GDP/Pop) <sub>it</sub>	1.145 <sup>a</sup> (0.007)	0.743 <sup>a</sup> (0.015)	0.764 <sup>a</sup> (0.023)			
ln (GDP/Pop) <sub>nt</sub>	0.909 <sup>a</sup> (0.007)	0.646 <sup>a</sup> (0.014)	0.676 <sup>a</sup> (0.024)			
ln Dist <sub>ni</sub>	-1.033 <sup>a</sup> (0.015)			-1.323 <sup>a</sup> (0.015)		
Shared Border <sub>ni</sub>	0.652 <sup>a</sup> (0.071)			0.459 <sup>a</sup> (0.072)		
Language <sub>ni</sub>	0.671 <sup>a</sup> (0.031)			0.559 <sup>a</sup> (0.029)		
Colonial History <sub>ni</sub>	2.226 <sup>a</sup> (0.241)			2.009 <sup>a</sup> (0.149)		
Still Colony 2011 <sub>ni</sub>	-1.197 <sup>c</sup> (0.632)			-0.372 (0.339)		
China - Col <sub>ni</sub>	0.627 <sup>c</sup> (0.329)			-0.141 (0.326)		
China - Still colony <sub>ni</sub>	-1.407 <sup>a</sup> (0.496)			-1.115 <sup>a</sup> (0.376)		
FTA <sub>nit</sub>	0.854 <sup>a</sup> (0.037)	0.384 <sup>a</sup> (0.023)	0.240 <sup>a</sup> (0.038)	0.604 <sup>a</sup> (0.036)	0.428 <sup>a</sup> (0.025)	-0.066 <sup>a</sup> (0.005)
Both GATT <sub>nit</sub>	0.193 <sup>a</sup> (0.019)	0.210 <sup>a</sup> (0.016)	0.340 <sup>a</sup> (0.037)	0.380 <sup>a</sup> (0.036)	0.175 <sup>a</sup> (0.029)	0.020 <sup>a</sup> (0.004)
Shared Currency <sub>nit</sub>	0.733 <sup>a</sup> (0.086)	0.423 <sup>a</sup> (0.059)	0.126 <sup>a</sup> (0.032)	0.810 <sup>a</sup> (0.075)	0.311 <sup>a</sup> (0.052)	0.018 <sup>c</sup> (0.009)
ACP to EU <sub>nit</sub>	0.156 <sup>a</sup> (0.059)	-0.680 <sup>a</sup> (0.053)	-0.200 <sup>b</sup> (0.100)	0.376 <sup>a</sup> (0.054)	-0.036 (0.051)	0.112 <sup>a</sup> (0.008)
Observations	731622	731622	1073038	818071	818071	1358554
R <sup>2</sup>	0.621	0.834		0.713	0.853	0.647
Country-time fixed-effects	-	-	-	yes	yes	yes
Country-pair fixed-effects	-	yes	yes	-	yes	yes
Time dummies	yes	yes	yes	yes	yes	yes

Note: Standard errors in parentheses, clustered by dyad. <sup>c</sup> p<0.1, <sup>b</sup> p<0.05, <sup>a</sup> p<0.01

proportional to what they could be, given the size of partners and their bilateral trade costs. This results will be echoed by our counterfactual experiment in the next section, investigating predicted trade flows under the counterfactual absence of independence. Trade between ongoing colonies and third countries (such as China) would be higher if colonies were independent.

Results estimated with PPML have the same sign as those estimated with OLS, and exhibit patterns emphasized in Head and Mayer (2014): the effects of countries’ size tend to be smaller in absolute value, PPML giving more weight to large flows in levels. Last, column (6) investigates whether the same determinants explain whether two countries have zero or positive trade flows. The dummy for positive flows is regressed, using the linear probability model, on the time-varying dyadic determinants, with the full set of fixed-effects.

### 3.3.5 China-colony partial effects

Figure 4 shows the estimates of the yearly partial effects of Chinese relations with former colonies after their independence. The six panels correspond to the specifications used in Table 1. Each black diamond is the exponential of the estimated China-colony effect for a given number of years after independence. The grey-shaded area represents the 90% confidence interval. Exponentiated independence effect estimated in Head et al. (2010) are displayed in the same panels as a check and comparison.

Estimates shown in the first panel depict an evolution which fits closely with the extraordinary role imputed to China in former colonies’s trade. Trade for these pairs of countries rises above the pre-independence level during the first decade after independence, and increases steadily until fifty years following separation. According

to these results based on time dummies, Chinese trade flows to ex-colonies could be interpreted as displaying abnormally high levels, suggesting a formal or informal change in bilateral trade costs following independence. Note however that because the estimates shown in panel 1 do not result from a theory-consistent estimation, it is impossible to point to the exact mechanism at work. More, since dyadic fixed-effects are not included, we cannot interpret the effect as working only through the time-dimension. We proceed to the necessary inclusion of control variables in the next panels.

Second panel estimates are obtained with the same estimator (OLS), however adding dyadic dummies, which restrict the identification to time-variation within the group of former colonies China trade flows. Since this specification controls for time-invariant omitted variables, the impressive increasing trend shown by the black diamonds could be interpreted as a confirmation of the first panel's singular role of China. At this stage the remaining checks for rigorous estimation include taking account of zero trade flows, and using together the full set of fixed-effects. The former task is performed in specification 3 and results are displayed in the third panel of figure 4. Estimates are obtained from the Poisson PMLE and using dyadic fixed-effects. Here again, the outcome persists in showing China-colonies effects on trade that are increasing in time.

Further panels however prevent from developing the story, and shed light on the different results obtained when taking into account the size of countries (among which China), hence their production and export capacity. Country-time fixed-effects are added to OLS in panel 4, and used together with dyadic fixed effects in panel 5. While estimates show above-norm trade flows for a sub-period of the sample, in both panels trade erodes (suddenly in panel 4, steadily in panel 5) to around 40 to 50% of the expected level. Results obtained with both sets of fixed-effects are

theory-consistent and allow a straightforward interpretation: taking into account the export and import capacities of countries, trade flows between former colonies and China after independence are not different from their level during the colonial period. Said differently, trade flows are not more than proportional to the level that could be expected each year, given the sizes and accessibilities of countries. In specification 5, which we favor because it includes theory-grounded controls for size and dyadic time-fixed determinants, former colonies' trade flows with China display a decreasing time-trend after their separation from the metropole, which is however rarely significant.

While these results relate to the intensive margin of trade, let us last investigate whether any China-colony specificity can be identified on the likelihood to develop new trade relationship within the pair. The last panel displays the effect of years of independence on the probability that former colonies build new trade relations with China after independence. We code the positive flows as one and estimate the specification using OLS with dyadic dummies and country-time fixed-effects. Results from the linear probability model exhibit a similar decreasing time-trend to the one obtained on the intensive margin, only shifted upwards. The higher probability to trade with China erodes after thirty years of independence and becomes mostly non significant. The dyadic fixed-effects focus the interpretation on within time variation: the increased probability to trade is compared to the likelihood of positive flows during the colonial period.

At this stage of the analysis, we investigated two of the three channels that may explain an increase in trade flows between China and ex-colonies. In the graphical representation of trade flows according to the naive gravity equation, we saw that the inclusion of the basic determinants of trade is able to suppress, or at least strongly attenuate, the upward trend in ex-colonies' share of imports from China. Then we

estimated China-colonies yearly effects after independence in a structural gravity approach. Using dyadic fixed-effects to analyze the within time trend of China-colonies' variables, together with the theory-consistent set of country-time dummies, we do not find any evidence of an increasing and significant post-independence effect of preferential trade relations between former colonies and China. We now turn to the third channel through which a structural gravity equation can explain a surge in post-independence Chinese trade flows to former colonies.

### 3.4 The gravity equation, trade costs and the redirection effect

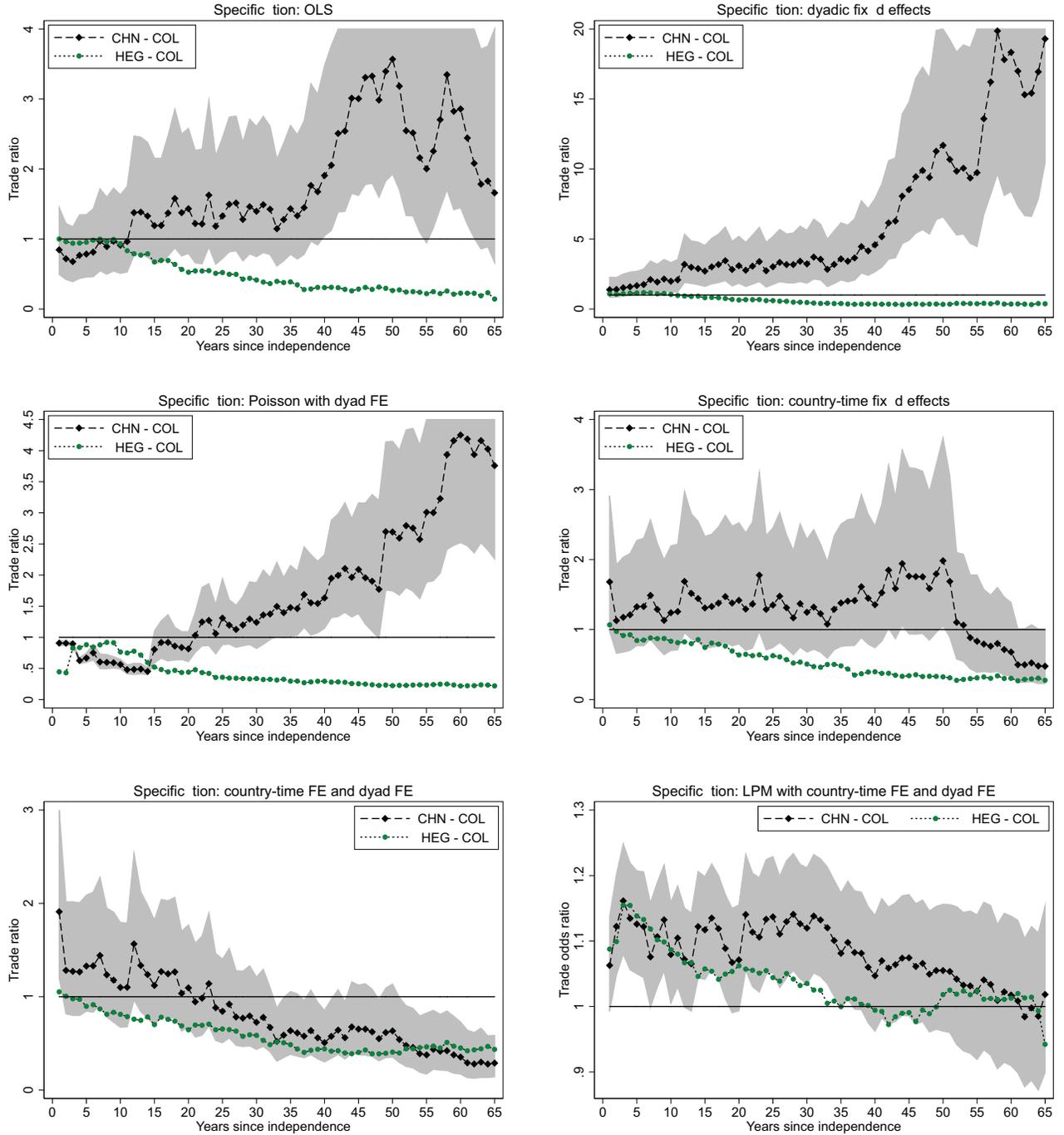
Although China is thought of having developed intense trade relations in particular with formerly colonized countries, gravity estimations on trade flows during 1948-2011 do not highlight significant coefficients on post-independence trade flows for these pairs.

This finding does not however rule out that former colonies' level of trade with China is influenced by their colonial past. Indeed, structural gravity equations state that a trade cost change does not only generate a Partial Trade Impact (measured by exponentiating the estimated coefficient), but is also followed by indirect trade increases for all other pairs, through the adjustment of multilateral resistances  $\Omega_{it}$  and  $\Phi_{nt}$ . Head and Mayer (2014) label this effect the Modular Trade Impact (MTI), which measures the indirect effect of a trade cost change on third-countries' trade flows, holding GDPs constant<sup>8</sup>

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<sup>8</sup>Note that the General Equilibrium Trade Impact - GETI - could also be computed. It assesses the trade creation effect, trade diversion, and induced changes in incomes. We concentrate on quantifying the redistribution effect on trade that is caused by independence. GETI would go

Figure 3.4: Partial Trade effects of China-former colonies bilateral accessibility



In the case of independence, structural gravity implies that the trade cost increase between former colonial pairs generates an automatic redirection of trade flows (the MTI) towards all other countries in the world. The redirection channels through price indices of all countries, which vary following the change in independence trade costs. We may thus expect to find that trade between former-colonies and China has risen following independence events, due to the reorientation of trade flows. In the following, we quantify the share of trade flows increase between China and former colonies that is due to the division of colonial empires. For this we proceed in two steps. We first compute the predicted trade level between China and former colonies, given GDPs and factual bilateral trade costs. We need to compute this ‘theoretical trade’ matrix mimicking real trade flows, in order to compare it to the second, alternative trade matrix. The second step is thus to calculate counterfactual trade levels that would have occurred if trade costs hadn’t involved independence of former colonies from their metropole. The only difference between the two predicted trade levels is thus the historical separation of colonized countries from their hegemon.

### 3.4.1 Partial effects

The first step involves computing predicted trade. Let us assume that bilateral trade costs contain the same time-varying determinants as in equation 7, only the China-colony bilateral effects are omitted because the counterfactual focuses on the effect of independence from the metropole:

$$B_{nit} = RTA_{nit} + GATT_{nit} + Curr_{nit} + ACPEU_{nit} + IndYr_{nit} \quad (3.9)$$

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further and recalculate the GDPs’ adjustments, including more than just the the reallocation of trade effect.

Since we already estimated gravity regressions on world bilateral trade flows, we use the previously estimated coefficients to reconstruct  $\ln \phi_{ni}$  for each pair of countries. Note that because bilateral accessibility contains both time-invariant and time-varying determinants, all coefficients aren’t available in our preferred specification, which captures time-fixed bilateral variables through country-pair dummies (column 5 in Table 1). We thus borrow the estimated coefficients from two different specifications. Coefficients for time-invariant variables (distance, contiguity, language, and invariant colonial history) are issued from the OLS estimation of the gravity equation (column 1 in Table 1), to which time dummies and dyadic clusters are added. Coefficients for time-varying variables (trade agreements, currency unions, and colonial history) are taken from the gravity estimation with country-time fixed-effects and dyadic dummies. The bilateral trade cost  $\phi_{ni}$  is assembled by exponentiating the sum of products between estimated coefficients (partial effects) and factual trade cost variables.

Using  $\phi_{ni}$  together with factual  $Y_i$  and  $X_n$ , a contraction mapping based on equation 4 gives  $\Phi_n$  and  $\Omega_i$ . Trade costs, GDPs and computed multilateral resistances are then plugged into equation 3 to obtain predicted factual trade  $X_{nit}$ . Despite the minimal number of variables and the imposed structure, the “fake” trade obtained through the structural gravity equation correlates at 73% with real trade. We are able to build the counterfactual story by changing one element of bilateral trade costs. Note that the method to calculate the MTI is able to simulate different scenarios for all variables that are part of bilateral accessibility: trade policy (undo the signature of a trade agreement), but also historical events (undo political ties, or disputes between countries). In the following, we simulate the continuity of colonies.

### 3.4.2 Counterfactual trade and the ratio of new to original trade

$\phi_{ni}$  is the variable through which we simulate the alternative scenario. By turning off one of the components, we obtain the new freeness of trade index  $\phi'_{ni}$ . We wish to cancel the increases in trade costs between colonies and metropolises following independence, hence to cancel the separation of colonial empires. We choose to do so for all countries whose independence date is superior to 1883. Countries that separated before 1883 are thus considered as independent. However all colonial relations that were ongoing in 1883 are coded as continuing in the counterfactual.

The new bilateral accessibility  $\phi'_{ni}$ , combined with  $Y_i$  and  $X_n$ , is plugged again into the contraction mapping to obtain the counterfactual  $\Omega'_i$  and  $\Phi'_n$ , and then counterfactual trade  $X'_{ni}$ . Note that because the effect runs through an adjustment of multilateral resistances, all country pairs trade flows are affected by the change in trade costs caused by inverting the independence events. We thus compute the world matrix of trade that would have prevailed in the absence of independence events. For any country pair, the comparison between the baseline trade and the counterfactual trade can be obtained. Following Head and Mayer (2014), for any change in trade cost the ratio of new bilateral trade to original trade, taking multilateral changes into account, is given by:

$$MTI_{ni} = \frac{X'_{ni}}{X_{ni}} = \exp[\beta(B'_{ni} - B_{ni})] \times \frac{\Omega_i \Phi_n}{\Omega'_i \Phi'_n} \quad (3.10)$$

The intuition for the effect on Chinese trade flows, particularly since the division of colonial empires, is the following. With independence, trade costs increase between colonies and their former metropole. Although historical and institutional proximity

may remain tight, separation creates new barriers to the movement of goods, but also to the exchange of information, to the flows of capital, services, and people. The gravity model for trade in goods predicts that higher trade costs impact not only trade between former colonized countries and their head of empire, but also the rest of world trade flows. Former colonies trade with third countries, and even trade between pairs of third-countries, increase, however in different proportions. The increase is due to price indexes absorbing the trade cost change and thus modifying upwards the denominator of the structural gravity equation.

### **3.4.3 Results**

Part of the increase in trade flows between China and former colonies would not have been observed under the counterfactual of persistent colonial relationships. We thus expect lower predicted trade flows associated to the absence of independence events, and thus a below one ratio of new to original trade. Table 2 displays the ratios of predicted imports from China without independence over predicted imports from China with independence, for former colonies of either France, Great-Britain, or Russia. The ratio is computed in levels for each year shown in the table. The table indicates for example, that in 1970 trade flows between China and French colonies would have been 7% lower, had independence not happened. Said differently, the contribution of independence to bilateral trade flows of former colonies with China is an increase by 7% for the year 1970.

The same comparisons are made for British, and Russian former colonies, the latter number available after independence of its colonies in 1991. All three groups report below one numbers, indicating a positive effect of independence on outside-pairs trade. The ratio of counterfactual over predicted trade decreases: this pattern

Table 3.2: Predicted ratio of imports from China, without independence

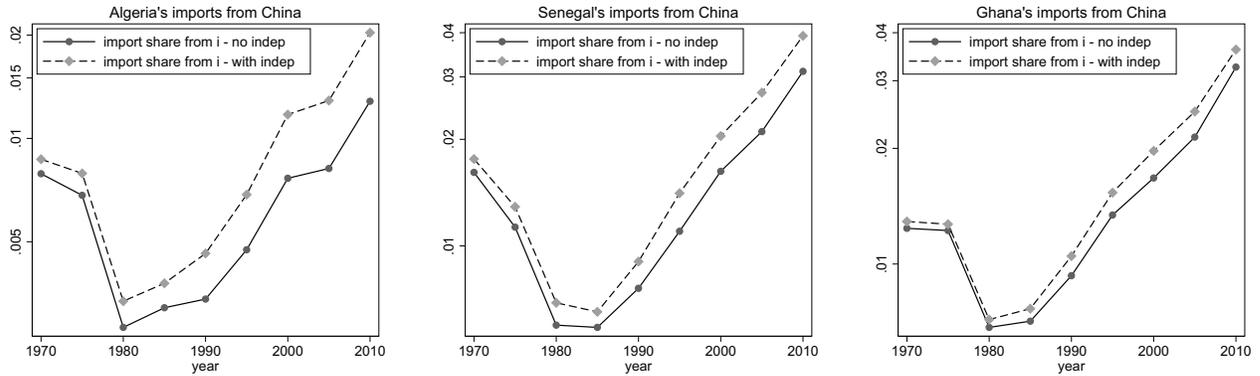
Year	France	Great-britain	Russia
1970	.93	.99	
1975	.89	.98	
1980	.89	.98	
1985	.9	.97	
1990	.86	.97	
1995	.83	.96	1
2000	.84	.94	.94
2005	.83	.93	.9
2010	.85	.93	.84

Columns contain the ratio of average predicted imports from China without independence, over average predicted imports with independence (for each group of former French, British, or Russian colonies). Predicted exports are computed according to the modular trade impact method following Head and Mayer (2014).

comes from the estimated independence effect, which gets larger as time passes since independence. It also highlights that the contribution of separations to the redistribution of trade is larger in recent years. In 2010 trade flows between China and former colonies are 15% higher than what they would have been with the persistence of colonial relationships.

These differences in trade flows by year are presented graphically in figure (5). The two panels display the evolution of the “fake” shares of imports from China, computed alternatively with factual trade costs and with counterfactual trade costs that cancel independence events. In echo to the previous results, we observe an increasing effect of independence on trade flows with China, for Algeria, Senegal and Ghana.

Figure 3.5: Differences in trade flows with and without independence



Last, table 3 displays the difference in amount of change of trade since 1995. One reads for instance, that if they were still under colonial domination, between 1995 and 2010 the growth of French colonies imports from China would have been 15% lower. On average, trade flows have increased by 15% more than what they would have done under persistent colonial relationships.

Table 3.3: Predicted growth in imports from China since 1995, without independence

Year	France	Great-britain	Russia
2000	.88	1.04	.83
2005	.84	.91	.85
2010	.85	.93	.82

Columns contain the ratio of the average change in predicted exports from China since 1995 for the group of former French, British, Russian colonies. Predicted exports are computed according to the modular trade impact method following Head and Mayer (2014).

## 3.5 Conclusion

In this paper we investigate the often heard idea that China has taken over an exceptional trade role in former colonies, replacing the former hegemon in the hierarchy of preferential market access. Indeed imports of those countries from China have risen markedly over time, to currently reach similar levels to what the countries import from the former colonizer.

We show that this pattern can be fully explained by the typical trade determinants of the theory-consistent gravity literature. In other words, contrary to what ex-colonial countries still import from their former metropole, we don't find an abnormally high flow when the exporter is China.

Our paper can be viewed as a illustration of two important facts. First, the structural version of gravity is a very useful tool to disentangle the effects of bilateral versus multilateral frictions on trade. In our case, the impressive increase of China's exports to the colonial world is entirely explained by the multilateral part. On the importer side, the multilateral resistance effect is the 'normal' reallocation effect

of trade towards countries other than the ex-hegemon (including China). On the outward side, the gravity equation takes into account that China has become a more performant exporter (towards all countries in the world) during this period. Nothing special is left to be explained by a change in the bilateral frictions between ex-colonies and China. Second, our results might also illustrate the importance of formal trade integration. Lacking linguistic, historical and cultural linkages with most of the colonial countries, China benefitted from the redirection following independence like any other country. Note that China did not sign over that period formal preferential agreements that might have triggered a higher share of trade by newly independent countries. The recent change in the Chinese attitude towards preferential trade agreements offers on this ground interesting perspective of future research.

## Chapter 4

# Economic diplomacy: the “one-China policy” effect on trade<sup>1</sup>

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<sup>1</sup>This chapter corresponds to the paper “Economic diplomacy: the “one-China policy” effect on trade” under revision for the *China Economic Review*.

## 4.1 Introduction

The Chinese government frequently lobbies its trading partners when the partners undermine Beijing’s foreign policy. In 2007, a United Nations (hereafter UN) resolution was rejected when Taiwan wanted to become a member of this international organization<sup>2</sup>. South-Africa was criticized for refusing to grant the Dalai Lama a visa. More recently, the Gambia has severed diplomatic ties with Taiwan for reasons of “national strategic interest” by now counting 22 countries<sup>3</sup> in the world that recognize Taiwan. Since 1949, the Popular Republic of China (PRC) has applied the “One-China policy” (hereafter OCP) under the principle of “one China, two systems” in international relations with Taiwan. More precisely, PRC is the sole government representing the Chinese territory and population around the world whereas Taiwan must be a part of China with relative autonomy. Taiwan is another core interest of the Chinese authorities in foreign affairs, particularly in trade relationships with outside countries to isolate and compel Taiwan to apply this doctrine. According to Bergeijk et al. (2011), “economic diplomacy can be defined as the use of international political tools - diplomacy - to achieve economic objectives”. Following this definition, we study the use of specific diplomatic tools by China to improve the country’s position in international trade relations at the expense of Taiwan. This chapter’s contribution is the assessment of the effects of the OCP on Chinese and Taiwanese bilateral trade flows, of which no empirical studies have been conducted to date.

The links between trade and foreign policy have been increasingly studied, al-

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<sup>2</sup>[http://www.nytimes.com/2007/07/24/world/asia/24iht-taiwan.1.6799766.html?\\_r=0](http://www.nytimes.com/2007/07/24/world/asia/24iht-taiwan.1.6799766.html?_r=0)

<sup>3</sup>Burkina Faso, Sao Tome and Principe, Swaziland, Kiribati, Marshall Islands, Nauru, Palau, Solomon Islands, Tuvalu, Paraguay, Belize, Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines and the Holy See.

though without directly addressing this issue. Indeed, Nitsch (2007) investigated the impact of official state visits on bilateral trade and showed that this tool of foreign policy significantly improves trade for hosting countries. Rose (2007) shows that diplomatic representations have a positive effect on trade due to trade facilitation mechanisms that allow for a reduction in trade transactions. Yakop and Bergeijk (2011) extend this analysis for developing countries confirming the trade-promoting effect of embassies and consulates on trade. As suggested by Fuchs and Klann (2013), is political compliance a precondition for healthy trade relations with China? The authors find that visits by the Dalai Lama lead to a trade-deteriorating effect on exports to China for host countries only over a recent period. In other words, they empirically demonstrate the effectiveness of Chinese lobbying on their trading partners when these latter countries do not respect the doctrine of Chinese foreign policy.

We use two variables to approximate the OCP based on the works of Xin (2001) and Chiang (2004): first, the vote by countries of the UN resolution regarding China's recognition in 1971 when the PRC replaced Taiwan in the UN bodies by formally representing China in the international community ; second, the existence of bilateral diplomatic ties with China by which foreign countries recognize "the government of PRC as the sole legal government of China and the sole legal government representing the entire Chinese people". There are various examples of the tools used by the Chinese government to isolate Taiwan in international diplomatic and economic relations. Through the OCP, China tries to undermine Taiwanese bilateral trade by putting political pressure on trading partners, for example, by the temporary closure of embassies, or by putting economic pressure by granting trade preferences<sup>4</sup>. Furthermore, since the creation of the PRC in 1949, official diplomatic ties with Taiwan

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<sup>4</sup><http://esango.un.org/ldcportal/trade/news/-/blogs/china-announces-97-percent-dfqf-treatment-for-ldc-imports>

have drastically decreased, to the benefit of China. This chapter analyses whether the vote on China’s recognition by the UN in 1971 and the existence of diplomatic ties with China enhance the two-way trade flows of China with its trading partners. We suppose that a reverse effect occurs for Taiwanese bilateral trade flows due to China’s willingness to isolate Taiwan by applying its doctrine.

We perform a theory-consistent structural gravity model (Anderson and van Wincoop, 2003 ; Head and Mayer, 2014) with a worldwide database over the period 1948-2012. Indeed, we improve our regressions with country-year and country-pair fixed effects to account for multilateral resistance and endogeneity of political factors. We also implement a Poisson pseudo-maximum likelihood (PPML) model to avoid an omission bias due to zero trade flows in the sample (Santos Silva and Tenreyro, 2006, 2011 ; Gomez Herrera, 2013 ; Fally, 2015). To determine whether the possible effects of these components of the OCP on bilateral trade flows vary over time, we decide to break down our variables of interest over a specific time period, i.e. all 5 years during the first 15 years after China’s recognition in 1971 and after the implementation of these diplomatic agreements.

The chapter is organized as follows. Section 2 presents a review of the literature on economic diplomacy. Section 3 describes the OCP. Section 4 details hypotheses, data and the empirical approach used. Section 5 discusses results and section 6 concludes.

## **4.2 Related literature: Economic diplomacy matters**

“Economists and diplomats are different specimen. For long they could neglect each other’s existence” (Bergeijk, 2009). The interaction between economists and

diplomats has become an increasingly popular topic in the economic and international relations literature. According to Bergeijk (2009), “economic diplomacy is at the interface between these subject fields as its aim is to influence decisions about cross-border economic activities pursued by governments and non-state actors”. To better grasp this dimension in international trade relations several papers have empirically demonstrated the strong links between diplomacy and trade.

Indeed, Rose (2007) analysed the effects of foreign services (embassies, consulates, foreign missions<sup>5</sup>) on the trade of exporting countries. These diplomatic representations sustain the interests of the represented States, but they also tend to improve market access through the fall of transactions costs. Rose considers the example of the US Commercial Service, which allows for business partners to be found, the identification of trade opportunities, advice on market potential and help in launching a company. Rose finds that the presence of foreign embassies in countries improves their exports. Yakop and Bergeijk (2011) focus on the impact of embassies and consulates within the OECD and in South-South trade. They confirm that these diplomatic tools decrease the risk of future (trade) distortions, and they further knowledge about foreign markets. They use a larger dataset than that used by Rose (2007), and they obtain two sets of results. On the one hand, these diplomatic representations enhance trade between developing countries to a greater extent than that between OECD countries because of the trade cost gap. On the other hand, these tools of economic diplomacy could be used to set government failures in motion to diminish insecurity and the high transaction costs in less-developed countries. Bergeijk et al. (2011) confirm these findings, suggesting that compared with other

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<sup>5</sup>Head and Ries (2010) provide an empirical examination of how Canadian trade missions are associated with trade creation. In this case study, the authors find that trade missions do not increase bilateral trade between beneficiary and donor countries when country-pairs are included in gravity regressions.

forms of representation, embassies are important tools for facilitating trade.

Nitsch (2007) studied the impact of political factors on trade through official visits of Heads of State in exporting countries. He found that the official travels of France, Germany and the US lead to the promotion of exports for host countries. Nitsch justifies these results by indicating that they improve the conditions of doing business in exporting economies. Fuchs and Klann (2013) suggest that countries receiving the Dalai Lama tend to export less to China over a recent period and for a limited duration. There is evidence that Dalai Lama visits to foreign countries deteriorate trade with China. They argue that the Chinese government creates pressure to avoid all forms of Tibet recognition by the international community, and the government does not hesitate to increase impediments for exporting economies to the Chinese market.

## **4.3 Effects of “One-China policy” on bilateral trade**

### **4.3.1 OCP principle**

The confrontation between China and Taiwan started with the creation of the PRC in 1949. At that time, the victory of communists led the anti-PRC to form the Republic of China (ROC or Taiwan) sustained by the Kuomintang (KMT). The Chinese government developed a doctrine in international relations to isolate Taiwan but also to attempt a peaceful reunification of China. The OCP acknowledges that there is one China (PRC) and that Taiwan is a part of China through the principle of “one China, two systems”, which allows the opponents of this doctrine to be spared with relative autonomy for Taiwan. However, what are the actual effects?

A white paper released by the Taiwan Affairs Office in 2000<sup>6</sup> details China’s position in foreign affairs regarding Taiwan relative to the rest of world. Indeed, “all countries maintaining diplomatic relations with China have [...] understanding with the Chinese Government not to establish any ties of an official nature with Taiwan”. More precisely, China is the only sovereign state that represents the Chinese people in the international community: “as part of China, Taiwan has no right to represent China in the international community, nor can it establish diplomatic ties or enter into relations of an official nature with foreign countries”. Nevertheless, to Taiwan’s benefit, the Chinese government allows Taiwan to belong to international organizations such as the Asia-Pacific Economic Community, the Asian Development Bank, and the World Trade Organization under the name “Chinese Taipei”. Furthermore, “the Chinese Government has not objected to non-governmental economic or cultural exchanges between Taiwan and foreign countries” increasing unofficial relations<sup>7</sup> with Taiwan through representatives and trade offices. “The Taiwan government uses its “official unofficial” representatives to pursue both traditional government-to-government diplomacy and public diplomacy aimed at securing popular support for Taiwan in democratic countries” (Rigger, 2011).

The Taiwanese authority has adopted an opposing position about the OCP. On the one hand, the Taiwanese constitution that went into effect in 1947 underlines the principle of “two Chinas” through article 141 concerning foreign policy: “The foreign policy of the Republic of China shall be conceived in a spirit of independence and self-reliance and based on the principles of equality and reciprocity to promote friendly relations with other nations and abide by treaties and the Charter of the

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<sup>6</sup><http://www.china.org.cn/english/taiwan/7956.htm>

<sup>7</sup><http://thediplomat.com/2014/05/the-odd-couple-japan-taiwans-unlikely-friendship/>

United Nations so as to protect the rights and interests of Chinese citizens residing abroad, foster international cooperation, advance international justice, and insure world peace.”<sup>8</sup> This is a scathing response to the principle of “one China, two systems”. For instance, Taiwan also severed diplomatic relations with several foreign countries due to the (re-)establishment of diplomatic ties with China, such as with Senegal in 2005: “The Republic of China (Taiwan) deeply regretted this and decided to break relations with Senegal immediately and stop all aid programs to the country to safeguard the dignity and sovereignty of our country”<sup>9</sup>. The diplomatic resistance of Taiwan has also led to a dual recognition that undermines the reunification project of China. China uses its diplomatic and economic influence to compel them: “the Chinese government is firmly against this scheme”<sup>10</sup>. The situation clearly resembles a fight of influence between the “two Chinas” in which international economic relations represent the main playing field.

Figure 1 presents certain trade differences between China and Taiwan. The figure illustrates the balance of power between China and Taiwan, in which the weight of Taiwan in world trade remains highly marginal relative to that of China. First, we observe that export flows carry greater weight in the Taiwanese GDP than in the Chinese GDP, i.e. approximately 60% and 45%, respectively, in 2012, with an impressive growing trend over the studied period. Second, unlike Taiwan, China reverses the trend in the early 1990s, when export flows are weighted by the world GDP. This trend clearly demonstrate the impact of the export-growth strategy of China since this period.

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<sup>8</sup><http://www.taiwandocuments.org/constitution01.htm>

<sup>9</sup><http://www.sinodaily.com/2005/051025183334.cmrz89g6.html>

<sup>10</sup><http://www.china.org.cn/e-white/taiwan/10-6.htm>

### 4.3.2 Foreign policy as a determinant of bilateral trade

As discussed by Fuchs and Klann (2013) regarding the case of the Dalai Lama, we suppose that countries that do not respect the OCP are “victims” to economic and political retaliations by China leading to a trade-deteriorating effect. According to the white paper previously quoted, China made the OCP an exception to the principle of non-interference that characterizes Beijing’s foreign policy. Indeed, “certain countries have breached the undertaking made at the time of the establishment of diplomatic ties with the People’s Republic of China by evolving official relations with Taiwan, thereby putting a spoke in the wheel of China’s reunification. The Chinese Government sincerely hopes that the governments in question will take measures to rectify the situation”<sup>11</sup>. The threat of severing diplomatic ties is the principal tool used by China but also by Taiwan when countries do not respect their doctrine in foreign policy. To date, more than 160 countries have entered diplomatic relations with China, demonstrating the relative effectiveness of the OCP. We also observe a similarity effect between the beginning of diplomatic relationships with China and their break with Taiwan. In other words, when countries establish diplomatic relations with China some time later they break up with Taiwan.

Several facts well illustrate how China lobbies foreign countries. In 1992, the French government sold planes to Taiwan when China decided to order France to close its Canton consulate in retaliation<sup>12</sup> because this agreement threatened the territorial integrity of China. “We strongly demand the French Government refrain from approving such a contract. If it ignores the strong opposition of the Chinese side and insists on having its own way, the Chinese side will react strongly.”<sup>13</sup> Sim-

<sup>11</sup><http://www.china.org.cn/e-white/taiwan/10-6.htm>

<sup>12</sup>[http://articles.latimes.com/1992-12-24/news/mn-3575\\_1\\_china-french-sale](http://articles.latimes.com/1992-12-24/news/mn-3575_1_china-french-sale)

<sup>13</sup><http://www.nytimes.com/1992/11/20/world/chinese-angered-by-french-arms-sale-to-taiwan.html>

ilarly, the Chinese government has suspended several military agreements with the American administration and companies because of the arms sales to Taiwan in 2009-2010<sup>14</sup>. Moreover, under the Clinton Administration, the announcement of a visit to the US by the Taiwanese President led to a diplomatic conflict between the two countries. US Congress largely voted for this unofficial visit at the expense of the White House’s reluctance under Chinese pressure<sup>15</sup>. Since 1976, the Government of Papua New Guinea has recognized China, but in 1999, the former approved the establishment of diplomatic relations with Taiwan, provoking China to threaten to “use its veto on the Security Council in relation to any matter that might come up referring to Papua New Guinea”<sup>16</sup>. Papua New Guinea ultimately surrendered.

However, the first success was the UN’s recognition of China in 1971 (Figure 2), which was adopted by the United Nations General Assembly at its 26<sup>th</sup> session, through Resolution 2758 at the expense of Taiwan<sup>17</sup>. European countries, LDCs (mainly Africa) and oil producing countries supported the accession of China whereas the US resolution adopted by Japan, Australia, Pacific islands and the majority of South-American countries (Table 9). This result in favor of China is not due to chance because Chinese leaders have essentially visited African countries (Egypt, Morocco, Algeria, Tunisia, Ghana, Mali, Guinea, Sudan, Ethiopia, Somalia) in order to establish and expand trade relations since the mid-1960s<sup>18</sup>, i.e. some years before the famous UN resolution. According to the National Archives of President Nixon, the Taiwanese diplomacy had fear that European economies support their exclusion

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<sup>14</sup><http://www.nytimes.com/2010/01/31/world/asia/31china.html>

<sup>15</sup><http://www.nytimes.com/1995/05/11/world/clinton-rebuffs-senate-on-letting-taiwan-president-visit-us.html>

<sup>16</sup><http://www.abc.net.au/pm/stories/s34814.htm>

<sup>17</sup>Albania presented this resolution eight times against the US, which defended maintaining Taiwan in the UN, which was finally rejected by 59 voices (55 for and 15 abstentions) whereas the Albanian resolution as adopted by 76 voices (35 against and 17 abstentions).

<sup>18</sup><http://www.fmprc.gov.cn/ce/ceza/eng/zghfz/zfgx/t165323.htm>

in order to develop and increase trade with China: “they’re afraid that other countries might use their absence from the UN as sort of a pretext for discriminatory actions against them, even in the trade sector”<sup>19</sup>. Nevertheless, there were official and unofficial relations with Taiwan<sup>20</sup> despite this decision, with foreign countries like the US voting the Taiwan Relations Act (1979)<sup>21</sup> without challenging the UN resolution.

## 4.4 Hypotheses, data and estimation strategy

### 4.4.1 Hypotheses

Since the creation of the PRC, the Chinese government has sought to weaken the Taiwanese position by placing pressure on outside countries that have official relations with Taiwan to have China reunified. The two components of the OCP previously described must have different effects on the trade flows of China and Taiwan with their trading partners. In this context, we formulate three main hypotheses.

First, Chinese and Taiwanese bilateral trade flows could enhance or deteriorate according to the nature of the vote of their trading partners regarding the UN resolution for China’s recognition in 1971 (Table 9). Indeed, countries having voted “Yes” could see their trade flows increase with China, whereas a reverse effect could appear with Taiwan in this case. In other words, countries having recognized the PRC as “one China” to the detriment of Taiwan enjoy better market access, reduced bilateral tensions with China and the probability of the use of retaliations (closing

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<sup>19</sup><https://history.state.gov/historicaldocuments/frus1969-76v17/d136>

<sup>20</sup><http://www.taipeitimes.com/News/taiwan/archives/2012/03/09/2003527354>

<sup>21</sup> “It is the policy of the United States to maintain the capacity of the United States to resist any resort to force or other forms of coercion that would jeopardize the security, or the social or economic system, of the people on Taiwan.” <http://www.ait.org.tw/en/taiwan-relations-act.html>

diplomatic representations, postponing trade missions or negotiations, rising tariff and non-tariff barriers) against them which could push bilateral trade upward. For countries having voted “No”, there could be a trade-promoting effect for Taiwanese bilateral trade flows and a trade-deteriorating effect for China in so far as the latter could then apply retaliation measures. For the abstention vote, the expected effects are mixed because we suppose that China ensured the results of this vote.

Second, the fact that countries have diplomatic ties with China could lead to improved Chinese trade flows, whereas for Taiwan, this situation could become a hindrance in trade relationships. As previously indicated, the establishment of diplomatic ties with China implies that these foreign countries unilaterally sever relations with Taiwan, which would allow for better political bilateral relationships with China by complying with the diplomatic commitments, that appear in these agreements. For instance, in the US-China Joint communiqué in 1979 on the establishment of diplomatic relations, it is clearly stated two main points. On the one hand, “the government of the United States of America acknowledges the Chinese position that there is one China and Taiwan is part of China”, i.e. the assertion of the OCP. Nevertheless, due to the particular status of the US, they intend to promote relationships with Taiwan: “within this context, the people of the United States will maintain cultural, commercial, and other unofficial relations with the people of Taiwan”. On the other a hand, “the United States of America and the People’s Republic of China will exchange ambassadors and establish embassies”. Chinese bilateral trade flows are likely to be improved, when the trading partners have diplomatic agreements with China. “Alliances and diplomatic ties reinforce states’ commitments to trade openness in several manners” (Bagozzi and Landis, 2015). Indeed, they allow to reciprocally facilitate market access through diplomatic exchanges and the presence of diplomatic representations leading to a decrease of transaction costs. Therefore, a

better trade opening towards the outward and a trade-promoting effect can appear.

Third, we suppose that the impact of diplomatic ties with China on bilateral trade flows may differ according to the nature of trading partners, i.e. developed (herein OECD) and developing countries (herein ex-colonies). Several reasons can justify this intuition. On the one hand, we observed that developing countries, more precisely former colonies, have been the first countries to recognize China after their independence, unlike developed countries. We suppose that “premium-recognition” could positively affect trade flows through a “win-win” partnership (financial aid, cooperation) between them. Moreover, we observe that African ex-colonies are the main countries where China has cut diplomatic ties (Table 10) because of the establishment of diplomatic relations with Taiwan<sup>22</sup>. Suspending political relations between countries undermines economic exchanges, as observed for Cuba and Iran, which perfectly illustrate the economic repercussions. On the other hand, Chinese economic expansion in Africa “is coupled with a diplomatic activism”<sup>23</sup>, which has led some African countries to cut diplomatic ties with Taiwan under the threat of retaliations.

#### 4.4.2 Data

We use a worldwide database<sup>24</sup> with more than 1.3 million observations over the period 1948-2012. This database includes the traditional variables in a gravity model, such as GDP, GDP per capita, geographical distance, shared language, contiguity,

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<sup>22</sup>Chad, Burkina Faso, Guinea Bissau, Lesotho, Gambia, Niger, Senegal, Benin, Central African Republic.

<sup>23</sup><http://www.forum2000.cz/en/projects/forum-2000-conferences/2014/panel-summaries-and-transcripts/expansion-of-the-global-economic-influence-of-china/>

<sup>24</sup>See the website of Keith Head: <http://strategy.sauder.ubc.ca/head/sup/>

former colonizers, and trade agreements<sup>25</sup>. Our dependent variable is the value, in millions of dollars, of bilateral exports ( $X_{ijt}$ ) constructed by DOTS (IMF) and complemented by COMTRADE. We decide to approximate the OCP through the channels of foreign policy to better grasp the elements described in Section 3. We have two main variables of interest: i) countries’ vote on China’s recognition by the UN in 1971<sup>26</sup> (Table 9) ; ii) diplomatic relationships with China<sup>27</sup> (Table 10).

### 4.4.3 Theoretical and empirical background

To investigate the effects of foreign policy (herein OCP) on bilateral trade flows, we implement an empirical tool commonly used in the international trade literature: the structural gravity model. Equation 1 shows the economic intuition derived from Newton’s law with the positive and proportional effect of economic size of trading partners ( $Y_i, E_j$ ) on bilateral trade ( $X_{ij}$ ) and the reverse effect of trade costs ( $\tau_{ij}$ ). Indeed, based on the Armington hypotheses about specialization, identical constant elasticity substitution ( $\sigma$ ) and the theoretical-consistent background developed by Anderson and van Wincoop (2003), we formulate the following theoretical gravity equation:

$$X_{ij} = \left( \frac{Y_i E_j}{Y_w} \right) \left( \frac{\tau_{ij}}{P_i P_j} \right)^{1-\sigma} \quad (4.1)$$

We estimate a structural gravity model (Head and Mayer, 2014) by taking into account multilateral resistance (Anderson and van Wincoop, 2003) through fixed

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<sup>25</sup>For more details about how the data were derived, see the appendix of Head et al. (2010): <http://strategy.sauder.ubc.ca/head/Papers/erosion.pdf>.

<sup>26</sup><http://minilien.fr/a0sgsa>

<sup>27</sup>[http://en.wikipedia.org/wiki/Dates\\_of\\_establishment\\_of\\_diplomatic\\_relations\\_with\\_the\\_People's\\_Republic\\_of\\_China#cite\\_note-1](http://en.wikipedia.org/wiki/Dates_of_establishment_of_diplomatic_relations_with_the_People's_Republic_of_China#cite_note-1) and complemented with Mackerras (2001), Taylor (2010), Shinn and Eisenman (2012).

effects<sup>28</sup> (country-year and country-pair). This method captures other trade costs across other export and import markets through relative price effects ( $P_i, P_j$ ). The exclusion of these terms leads to an omission bias with more unobserved trade barriers. To the extent that it is very difficult to have price indices for each country of the sample, fixed effects through country-year and country-pair allow for this multilateral resistance to be taken into account even if some variables will be removed according to the fixed effects used (Equations 2-3). We also improve our regressions with a Huber-White estimator to avoid any heteroscedasticity issue and thus to have robust standard errors clustered by country-pair.

Our empirical gravity equations have the following forms:

$$\ln X_{ijt} = \beta_0 + \beta_1 UN\_vote_{ijt} + \gamma_{it} + \gamma_{jt} + \gamma_{ij} + n_t + \epsilon_{ijt} \quad (4.2)$$

$$\ln X_{ijt} = \beta_0 + \beta_1 Diplomacy\_China_{ijt} + \gamma_{it} + \gamma_{jt} + \gamma_{ij} + n_t + \epsilon_{ijt} \quad (4.3)$$

where  $X_{ijt}$  is the bilateral export flows between  $i$  (origin country) and  $j$  (destination country) at year  $t$ . Following Baldwin and Taglioni (2006) and Head and Mayer (2014) we include country-year fixed effects ( $\gamma_{i(j)t}$ ), country-pair fixed effects ( $\gamma_{ij}$ ) and time dummies ( $n_t$ ).  $\epsilon_{ijt}$  is a random error term satisfying typical assumptions. OCP is broken into two components: the vote of China's recognition by the UN in 1971 ( $UN\_vote_{ijt}$ ) and the presence of diplomatic ties between outside countries and China ( $Diplomacy\_China_{ijt}$ ).

We specify the following dummy variables.  $UN\_vote_{ijt}$  (Table 9) is decomposed according to the nature of the vote (Yes, No, Abstention).  $UN\_vote\_Yes_{ijt}$  equals 1 for relationships between countries having voted "Yes" and China for each year since

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<sup>28</sup>The tetrad method (Head et al., 2010) can be used, but this approach is sensitive to the reference countries chosen (Head and Mayer, 2014).

China’s recognition by the UN in 1971, and 0 otherwise.  $UN\_vote\_No_{ijt}$  equals 1 for relationships between countries having voted “No” and China for each year since China’s recognition by the UN in 1971, and 0 otherwise.  $UN\_vote\_Abs_{ijt}$  equals 1 for relationships between countries that abstained and China for each year since China’s recognition by the UN in 1971, and 0 otherwise.  $Diplomacy\_China_{ijt}$  (Table 10) is equal to 1 for relationships between countries and China depending on whether there are diplomatic ties with China, and 0 otherwise. The same specifications are made for the Taiwanese bilateral trade flows concerning these two variables of interest.

We then disaggregate our second variable of interest ( $Diplomacy\_China_{ijt}$ ) across developed (OECD)<sup>29</sup> and developing countries (ex-colonies)<sup>30</sup> to search for evidence of heterogeneity of diplomatic ties on trade flows according to trading partners of China and Taiwan.

Alternatively, we employ PPML with country-pair fixed effects<sup>31</sup> (Equations 4-5) to resolve any omission bias with the presence of zero flows in our sample. The log-linear form is unable to handle zero trade flows because the logarithm of zero is undefined, in this respect, PPML is the empirical method most often employed because of its robustness (Santos Silva and Tenreyro, 2006, 2011 ; Gomez Herrera, 2013 ; Fally, 2015). We also correct for any potential endogeneity of political factors with panel data estimation techniques and country-pair fixed effects, as advocated by Baier and Bergstrand (2007).

The following equations are thus estimated, where  $\alpha_{i(j)t}$  captures time-varying monadic variables such as GDP and population of trading partners:

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<sup>29</sup>Europe (EU), North-America, South-America, Asia, Middle-East, Oceania.

<sup>30</sup>sub-Saharan-Africa (SSA), North-Africa, Asia, South-America

<sup>31</sup>Country-year fixed effects is a method “computationally burdensome and even impossible to apply in the case of large datasets that include many countries and years. [...] We therefore adopt another solution that consists of capturing these terms (multilateral resistance) with bilateral fixed effects.” (Lavallée and Lochard, 2015)

$$X_{ijt} = \beta_0 + \beta_1 \ln \alpha_{i(j)t} + \beta_2 UN\_vote_{ijt} + \gamma_{ij} + \mu_t + \epsilon_{ijt} \quad (4.4)$$

$$X_{ijt} = \beta_0 + \beta_1 \ln \alpha_{i(j)t} + \beta_2 Diplomacy\_China_{ijt} + \gamma_{ij} + \mu_t + \epsilon_{ijt} \quad (4.5)$$

We also want to provide evidence of economic diplomacy effects on bilateral trade flows over a specific time period. In other words, we capture the post effects of our variables of interest and then break down all 5 years: 5, 10 and 15 years after the vote on China's recognition in 1971 and the establishment of diplomatic ties with China. For instance,  $t5\_UN\_vote\_Yes_{ijt}$  equals 1 for relationships between countries having voted "Yes" and China for the 5 first years since China's recognition by the UN in 1971, and 0 otherwise.  $t5\_Diplomacy\_China_{ijt}$  equals 1 for relationships between countries having diplomatic ties with China for the 5 first years after the implementation of this diplomatic agreement, and 0 otherwise, etc. This instructive approach allows us to determine whether the effects of these components of the OCP on trade flows vary over time.

## 4.5 Results

The average effects of these channels ( $UN\_vote_{ijt}$ ,  $Diplomacy\_China_{ijt}$ ) are thereafter presented for the two-way trade flows of China and Taiwan. We provide findings for the first component of the OCP over the entire period since the UN vote in 1971 and for the second over the period since the establishment of diplomatic ties. We focus on PPML fixed-effect specifications to avoid misinterpreting the estimated coefficients by taking zero trade flows into account and to correct heteroscedasticity (Section 4.3).

### 4.5.1 Effects of the vote on China’s recognition by the UN

#### Exports to China and Chinese exports

Regardless of the nature of the vote (Table 1), the exports of countries to China as well as Chinese exports increased on average since the vote of this UN resolution in 1971. For instance, the exports of countries that voted “Yes” increased by 69% ( $\exp(0.53)-1$ ) on average since 1971 whereas Chinese exports with these countries increased by a factor of 5 ( $\exp(1.62)$ ). These findings can be justified by the fact that Chinese authorities have anticipated this favourable vote because of diplomatic activism by ensuring this result, particularly with the votes of African countries. In fact, the late 1960s was a crucial period for the development of economic and diplomatic relationships between China and Africa during which “Premier Zhou Enlai’s goodwill visit to 10 African countries between late 1963 and early 1964”<sup>32</sup>. The highest coefficients appear for countries having voted “No” due to the presence of the US. With this specification, China’s recognition by the UN strongly enhances Chinese bilateral trade, allowing for better access to the Chinese market in return.

#### Exports to Taiwan

Table 2 shows the results of regressions carried out to assess the impact of the vote on China’s recognition by the UN since 1971 on exports to Taiwan. Only countries that voted for this recognition witnessed their exports to Taiwan increase, whereas the other results are not significant. For instance, these countries’ exports increased by 109% ( $\exp(0.74)-1$ ) on average since the vote on the UN resolution. Herein, we suppose that Taiwanese authorities anticipated the failure of the resolution during this vote and the expected economic repercussions: “they’re afraid that other coun-

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<sup>32</sup><http://www.fmprc.gov.cn/ce/ceza/eng/zghfz/zfgx/t165323.htm>

tries might use their absence from the UN as sort of a pretext for discriminatory actions against them, even in the trade sector”<sup>33</sup>. More precisely, Taiwan did not use retaliation measures for countries that were against maintaining Taiwan’s position in the UN in order to not aggravate the situation. Indeed, the proposal of two seats in UN bodies had not been retained and the US claimed to not support Taiwan’s independence from China some time after this vote<sup>34</sup>.

### Taiwanese exports

The estimates presented in Table 2 suggest that a trade-promoting effect appears for Taiwanese exports to countries that voted for but also against China’s recognition by the UN. Indeed, these countries’s exports increased by 141% ( $\exp(0.88)-1$ ) and 136% ( $\exp(0.86)-1$ ) on average following the vote. We conclude that countries that voted “No” have been “rewarded” because bilateral Taiwanese exports have drastically increased at the same time. In other words, China’s recognition by the UN since 1971 has not led to the isolation of Taiwan in trade relationships, the situation is, quite the opposite. We suppose that the anticipation<sup>35</sup> of results neutralized the expected effect of China’s recognition by the UN despite the impressive lobbying<sup>36</sup> used by countries sustaining Taiwan to avoid its withdrawal. For instance, “a classified cable dated Oct. 5, 1971, shows Japan decided to help Malta, which had not revealed its position, to build a bridge and an undersea tunnel in an effort to secure the Mediterranean island states support for the two-thirds vote proposal”.

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<sup>33</sup><https://history.state.gov/historicaldocuments/frus1969-76v17/d136>

<sup>34</sup><https://history.state.gov/milestones/1969-1976/rapprochement-china>

<sup>35</sup><http://www.taipeitimes.com/News/local/archives/2001/09/12/102595/3>

<sup>36</sup><http://www.japantimes.co.jp/news/2015/01/15/national/politics-diplomacy/japan-lobbied-taiwan-keep-u-n-seat-1971-declassified-documents/#.Vp9JPWBf0bx>

## 4.5.2 Effects of bilateral diplomatic ties with China

### Exports to China

Table 3 illustrates the impact of diplomatic ties with China on exports to China over the period since the establishments of those ties. This second component of the OCP has the expected sign on trade. Indeed, we find a significant evidence that this component increases exports to China for OECD (except for Europe and Oceania, not significant) and ex-colonies (except for South-America, not significant). On average, former colonies having diplomatic relations with China have witnessed their exports to China increase to a greater extent than the exports of OECD members to China. Recently, several papers in the economic literature put forward the South-South trade expansion (Jenkins and Edwards, 2006 ; Kaplinsky and Messner, 2008 ; He, 2013), notably with “Asian drivers” such as China. Indeed, since the end of the 1990s, we have observed a trade reorientation of developing countries at the expense of developed countries due to the “shifting of wealth” to these economies. Furthermore, the establishment of diplomatic relations with China has led to the opening of embassies in China, which has allowed for better penetration into the Chinese market by reducing transaction costs for exporter countries.

### Chinese exports

Table 3 shows results concerning the expected trade-promoting effect of diplomatic exchanges with China on Chinese exports. We find evidence that Chinese exports to OECD countries and former colonies (except for North-Africa and South-America, not significant) increase when the trading partners have diplomatic relations with China. Finally, our assumption about the relevant effect of economic diplomacy on trade is strengthened through this second channel of the OCP. In other words, the

compliance of Chinese diplomatic commitments allows for the promotion of bilateral trade with the trading partners. For instance, diplomatic relations with China help enhance market access through several measures, such as trade facilitation and the granting of duty-free tariffs, as recently instituted by China for LDCs<sup>37</sup>. We therefore argue that the existence of diplomatic relationships with China is a means to reduce the probability that China uses retaliation measures depending whether outside countries persist in recognizing Taiwan.

### Exports to Taiwan

Table 4 displays robust coefficients concerning the effects of diplomatic relationships with China on bilateral exports to Taiwan. Diplomatic ties with China increased exports to Taiwan for OECD countries (except for Europe and Asia, not significant), and for African and Asian ex-colonies whereas exports to Taiwan decreased for South-American ex-colonies. For instance, China has increased its economic and political presence in South-America, the main group of countries having diplomatic relationships with Taiwan. “Taiwanese authorities are worried about a possible domino effect triggered by Costa Ricas decision to establish diplomatic ties with the PRC. Taipei is aware that the pressure on its allies to sever ties increases as Chinas role in the global economy rises.”<sup>38</sup> Once again, this other channel of the OCP is inefficient for exports to Taiwan. Globally, foreign countries having diplomatic relations with China have witnessed their exports to Taiwan improve. For instance, SSA ex-colonies export more to Taiwan than North-American OECD members, i.e. +197% ( $\exp(1.09)-1$ ) versus +30% ( $\exp(0.27)-1$ ), respectively on average.

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<sup>37</sup><http://www.china-briefing.com/news/2015/04/28/china-announces-duty-free-trade-status-to-all-least-developed-countries.html>

<sup>38</sup>[http://csis.org/files/media/isis/pubs/090310\\_chinesesoftpower\\_\\_chap8.pdf](http://csis.org/files/media/isis/pubs/090310_chinesesoftpower__chap8.pdf)

### Taiwanese exports

As shown in Table 4, Taiwanese exports to OECD (except for Asia, not significant) is higher for countries having diplomatic ties with China than for other countries over the studied period. Exports are 2.2 times higher ( $\exp(0.79)$ ) for European countries and 1.5 times higher ( $\exp(0.41)$ ) for North-American countries than for other countries. The effect is reversed for Taiwanese exports to ex-colonies where diplomatic ties with China reduce Taiwanese exports for all former colonies (except for South-America, not significant). In other words, results clearly suggest that diplomatic ties with China is more strongly hinder Taiwanese exports to former colonies than to OECD economies. This reasoning is coherent if we suppose that China exerts greater pressure (economic, political) on developing countries than on developed countries due to the growing development of South-South cooperation<sup>39</sup> (financial aid, cooperation, aid facilitation) between the countries. Moreover, we know that sometimes Taiwan does not hesitate to cut diplomatic ties, such as Costa Rica in 2007<sup>40</sup>, and accentuate retaliation measures by increasing trade costs.

### 4.5.3 Effects over time

To facilitate the interpretation of our findings, we mainly report the variables of interest over time because the control variables used are the same as those used to generate the previous results.

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<sup>39</sup><http://thediplomat.com/2013/11/why-taiwans-allies-are-flocking-to-beijing/>

<sup>40</sup>[http://www.nytimes.com/2007/06/07/world/asia/07iht-costa.1.6036203.html?\\_r=0](http://www.nytimes.com/2007/06/07/world/asia/07iht-costa.1.6036203.html?_r=0)

### **UN vote on China's recognition**

Results clearly suggest that a trade-deteriorating effect appears for countries having voted No and abstained during the first 5, 10, 15 years after the vote on the two-way trade flows of China (Table 5). More precisely, this effect appears to have been weaker during the first 10 years and stronger during the first 15 years after the UN vote. For Taiwan (Table 6), a trade-promoting effect is observed for countries that abstained during the first 5 and 10 years after the vote, whereas Taiwanese trade flows decreased for these countries during the first 15 years after the vote. We also observe that exports to Taiwan for countries having voted Yes decreased during the first 5 years after China's recognition in 1971. This decomposition of effects of China's recognition over time on bilateral trade flows therefore strengthens our previous findings.

### **Diplomatic relationships with China**

Concerning OECD economies having diplomatic ties with China, a decrease in bilateral trade flows with China is observed regardless of the period, although this effect appears to have weakened over time (Table 7). We suppose that the context of the "Cold War" during this period can explain this weakening of trade relationships due to the opposing positions of OECD countries and China regarding the USSR. A trade-deteriorating effect for Taiwanese bilateral trade flows appears during the first 5 and 10 years after the implementation of these diplomatic agreements, whereas an increase in trade flows is observed during the first 15 years (Table 8) to avoid exacerbating the isolation of Taiwan, particularly with respect to the US. For former colonies, we observe that bilateral trade flows with China essentially decreased for African ex-colonies due to the import-substitution launched during this period by

these latter countries, i.e. during the first 15 years after the establishment of diplomatic ties with China (Table 7). Furthermore, North-African and South-American exports to Taiwan decreased during the first 5 years after the establishment of diplomatic relations with China but increased during the first 10 and 15 first years (Table 8). Results are more mixed for Taiwanese exports to former colonies because the estimated coefficients are essentially significant during the first 10 years after the creation of these diplomatic agreements for North-African and Asian ex-colonies, positively and negatively, respectively.

## 4.6 Conclusion

We attempt to contribute to the literature on political factors and trade through the channel of economic diplomacy in the case of China’s foreign policy. Since 1949, the Chinese government has applied the OCP in its foreign policy to undermine Taiwan’s position in international relations and strengthen its own. In our case, the vote on China’s recognition by the UN in 1971 and diplomatic relationships with China can be useful measures. We know that China places pressure on its trading partners to compel Taiwan to change its position on China’s reunification. This chapter highlights evidence that economic diplomacy matters.

First, the vote on China’s recognition by the UN in 1971 leads to a trade-promoting effect for China and Taiwan regardless of the nature of the vote (Yes, No, Abstention) of their trading partners over the period since the vote of this UN resolution. Concerning Taiwan, these results can be explained by the presence of unofficial relationships with foreign countries but also by the anticipation of Taiwan’s withdrawal to avoid any diplomatic and economic isolation. Second, a trade-deteriorating effect on Taiwanese exports mainly appears for ex-colonies hav-

ing diplomatic ties with China unlike for OECD countries over the entire period since their establishment. China and Taiwan do not hesitate to sever diplomatic ties in retaliation when trading partners are not in compliance with their foreign policy doctrine, which weakens political relations by undermining bilateral trade flows. Third, there is an overall improvement of two-way trade flows for China when there are diplomatic ties. The same results are obtained for Chinese exports but with stronger effects. Findings clearly indicate that diplomatic ties with China strongly enhance China's trade position with outside countries. Fourth, when we investigate these effects over specific periods, we find that there is a trade-deteriorating effect with China for countries having voted No and abstained during the first 5, 10 and 15 years after the UN vote in 1971. *A contrario*, a trade-promoting effect with respect to Taiwan appears for countries that abstained during the first 5 and 10 years after China's recognition. Regarding the effects of diplomatic ties with China, there is a decrease in bilateral trade flows for some former colonies with China during the first 10 and 15 years after the creation of these diplomatic agreements. The effect is reversed for Taiwan but not during the first 5 years. For OECD countries having diplomatic ties with China, trade flows decrease during the first 5, 10 and 15 years after the implementation of these diplomatic agreements whereas results for Taiwanese trade flows show the same impact over similar periods but with an improvement of trade relationships during the first 15 years.

Finally, we demonstrate that the OCP does not fully succeed in marginalizing Taiwan in international trade, except with respect to certain ex-colonies. The estimates, however, underline that the OCP has mainly benefited China as its bilateral trade flows have drastically increased relative to those of Taiwan regardless the trading partners considered.

Table 4.1: Effects of the vote on China’s recognition by the UN on Chinese bilateral trade

	MFE	DFE	MFE & DFE	PPML
<i>ln GDP<sub>it</sub></i>		0.78 <sup>a</sup> (0.01)		0.81 <sup>a</sup> (0.03)
<i>ln GDP<sub>jt</sub></i>		0.65 <sup>a</sup> (0.01)		0.72 <sup>a</sup> (0.02)
<i>ln Population<sub>it</sub></i>		-0.48 <sup>a</sup> (0.03)		-0.20 <sup>b</sup> (0.08)
<i>ln Population<sub>jt</sub></i>		0.39 <sup>a</sup> (0.03)		-0.06 (0.07)
<i>ln Distance<sub>ij</sub></i>	-1.38 <sup>a</sup> (0.01)			
<i>ln Language<sub>ij</sub></i>	0.77 <sup>a</sup> (0.03)			
<i>ln Contiguity<sub>ij</sub></i>	0.56 <sup>a</sup> (0.07)			
<b>Vote on China’s recognition by the UN (exports to China)</b>				
<i>UN_vote_Yes<sub>ijt</sub></i>	1.05 <sup>a</sup> (0.25)	0.73 <sup>a</sup> (0.21)	-0.38 (0.40)	0.53 <sup>b</sup> (0.21)
<i>UN_vote_No<sub>ijt</sub></i>	1.87 <sup>a</sup> (0.29)	1.78 <sup>a</sup> (0.44)	0.36 (0.44)	1.39 <sup>a</sup> (0.16)
<i>UN_vote_Abs<sub>ijt</sub></i>	0.25 (0.36)	2.02 <sup>a</sup> (0.49)	0.28 (0.46)	1.23 <sup>a</sup> (0.39)
<b>Vote on China’s recognition by the UN (Chinese exports)</b>				
<i>UN_vote_Yes<sub>ijt</sub></i>	0.80 <sup>a</sup> (0.15)	1.59 <sup>a</sup> (0.13)	0.45 <sup>b</sup> (0.22)	1.62 <sup>a</sup> (0.28)
<i>UN_vote_No<sub>ijt</sub></i>	0.90 <sup>a</sup> (0.19)	2.21 <sup>a</sup> (0.25)	0.94 <sup>a</sup> (0.27)	3.37 <sup>a</sup> (0.86)
<i>UN_vote_Abs<sub>ijt</sub></i>	0.54 <sup>b</sup> (0.21)	2.69 <sup>a</sup> (0.51)	1.44 <sup>a</sup> (0.40)	2.29 <sup>a</sup> (0.81)
<i>Constant</i>	12.48 <sup>a</sup> (0.13)	-32.96 <sup>a</sup> (0.49)	0.75 <sup>a</sup> (0.002)	
Observations	818071	731622	818071	1073038
Country-year fixed effects	Yes	No	Yes	No
Country-pair fixed effects and time dummies	No	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.70	0.83	0.85	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels. MFE, DFE respectively mean monadic fixed effects and dyadic fixed effects.

Table 4.2: Effects of the vote on China's recognition by the UN on Taiwanese bi-lateral trade

	MFE	DFE	MFE & DFE	PPML
<i>ln GDP<sub>it</sub></i>		0.77 <sup>a</sup> (0.01)		0.81 <sup>a</sup> (0.03)
<i>ln GDP<sub>jt</sub></i>		0.65 <sup>a</sup> (0.01)		0.72 <sup>a</sup> (0.02)
<i>ln Population<sub>it</sub></i>		- 0.48 <sup>a</sup> (0.03)		-0.19 <sup>b</sup> (0.08)
<i>ln Population<sub>jt</sub></i>		0.39 <sup>a</sup> (0.03)		-0.06 (0.07)
<i>ln Distance<sub>ij</sub></i>	-1.38 <sup>a</sup> (0.01)			
<i>ln Language<sub>ij</sub></i>	0.77 <sup>a</sup> (0.03)			
<i>ln Contiguity<sub>ij</sub></i>	0.56 <sup>a</sup> (0.07)			
<b>Vote on China's recognition by the UN (exports to Taiwan)</b>				
<i>UN_vote_Yes<sub>ijt</sub></i>	0.88 <sup>b</sup> (0.34)	0.79 <sup>a</sup> (0.30)	0.30 (0.38)	0.74 <sup>a</sup> (0.28)
<i>UN_vote_No<sub>ijt</sub></i>	1.67 <sup>a</sup> (0.37)	1.31 <sup>a</sup> (0.29)	0.57 (0.44)	0.19 (0.34)
<i>UN_vote_Abs<sub>ijt</sub></i>	1.24 <sup>a</sup> (0.45)	1.30 <sup>a</sup> (0.38)	0.42 (0.64)	0.35 (0.46)
<b>Vote on China's recognition by the UN (Taiwanese exports)</b>				
<i>UN_vote_Yes<sub>ijt</sub></i>	1.02 <sup>a</sup> (0.27)	1.20 <sup>a</sup> (0.26)	1.06 (0.73)	0.88 <sup>a</sup> (0.22)
<i>UN_vote_No<sub>ijt</sub></i>	1.98 <sup>a</sup> (0.29)	1.46 <sup>a</sup> (0.29)	1.31 <sup>c</sup> (0.77)	0.86 <sup>b</sup> (0.44)
<i>UN_vote_Abs<sub>ijt</sub></i>	1.90 <sup>a</sup> (0.33)	1.66 <sup>a</sup> (0.41)	1.35 (0.87)	0.20 (0.24)
<i>Constant</i>	12.48 <sup>a</sup> (0.13)	-32.66 <sup>a</sup> (0.49)	0.75 <sup>a</sup> (0.001)	
Observations	818071	731622	818071	1073038
Country-year fixed effects	Yes	No	Yes	No
Country-pair fixed effects and time dummies	No	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.70	0.83	0.85	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 4.3: Effects of diplomatic ties with China on Chinese bilateral trade

	MFE	DFE	MFE & DFE	PPML
<i>ln GDP<sub>it</sub></i>		0.77 <sup>a</sup>		0.8 <sup>a</sup>
		(0.01)		(0.03)
<i>ln GDP<sub>jt</sub></i>		0.65 <sup>a</sup>		0.71 <sup>a</sup>
		(0.01)		(0.02)
<i>ln Population<sub>it</sub></i>		-0.48 <sup>a</sup>		-0.19 <sup>b</sup>
		(0.03)		(0.08)
<i>ln Population<sub>jt</sub></i>		0.40 <sup>a</sup>		-0.05
		(0.03)		(0.07)
<i>ln Distance<sub>ij</sub></i>	-1.38 <sup>a</sup>			
	(0.01)			
<i>ln Language<sub>ij</sub></i>	0.78 <sup>a</sup>			
	(0.03)			
<i>ln Contiguity<sub>ij</sub></i>	0.58 <sup>a</sup>			
	(0.07)			
<b>Diplomatic ties with China (Exports to China)</b>				
<i>OECD_EU<sub>ijt</sub></i>	-0.23	1.30 <sup>a</sup>	0.16	0.47
	(0.17)	(0.27)	(0.30)	(0.33)
<i>OECD_North-America<sub>ijt</sub></i>	0.97 <sup>b</sup>	2.07 <sup>a</sup>	0.83 <sup>a</sup>	1.52 <sup>a</sup>
	(0.38)	(0.19)	(0.17)	(0.25)
<i>OECD_Asia<sub>ijt</sub></i>	-1.09 <sup>a</sup>	1.87 <sup>a</sup>	0.67 <sup>a</sup>	0.90 <sup>a</sup>
	(0.16)	(0.35)	(0.19)	(0.14)
<i>OECD_Middle-East<sub>ijt</sub></i>	-0.04	2.84 <sup>a</sup>	0.80 <sup>b</sup>	0.36 <sup>a</sup>
	(0.16)	(0.05)	(0.33)	(0.03)
<i>OECD_Oceania<sub>ijt</sub></i>	1.52 <sup>a</sup>	0.44	0.39	-0.49
	(0.38)	(0.65)	(0.49)	(0.63)
<i>SSA_Colony<sub>ijt</sub></i>	0.90 <sup>a</sup>	0.40	0.36	1.21 <sup>c</sup>
	(0.29)	(0.35)	(0.35)	(0.64)
<i>North-Africa_Colony<sub>ijt</sub></i>	0.59 <sup>c</sup>	1.11 <sup>a</sup>	-0.02	2.15 <sup>a</sup>
	(0.34)	(0.04)	(0.28)	(0.57)
<i>Asia_Colony<sub>ijt</sub></i>	-0.60 <sup>b</sup>	1.57 <sup>b</sup>	0.41	1.63 <sup>b</sup>
	(0.25)	(0.62)	(0.44)	(0.65)
<i>South-America_Colony<sub>ijt</sub></i>	-1.04 <sup>a</sup>	-1.29	-1.99	0.05
	(0.31)	(1.56)	(1.28)	(0.66)
<b>Diplomatic ties with China (Chinese exports)</b>				
<i>OECD_EU<sub>ijt</sub></i>	-0.28 <sup>b</sup>	2.15 <sup>a</sup>	0.29	1.28 <sup>a</sup>
	(0.12)	(0.21)	(0.20)	(0.22)
<i>OECD_North-America<sub>ijt</sub></i>	0.41 <sup>a</sup>	3.72 <sup>a</sup>	1.31 <sup>b</sup>	4.45 <sup>a</sup>
	(0.14)	(0.59)	(0.56)	(0.09)
<i>OECD_Asia<sub>ijt</sub></i>	-1.854 <sup>a</sup>	1.67 <sup>a</sup>	-0.16	0.87 <sup>a</sup>
	(0.19)	(0.47)	(0.12)	(0.33)
<i>OECD_Middle-East<sub>ijt</sub></i>	-0.86 <sup>a</sup>	3.88 <sup>a</sup>	1.47 <sup>a</sup>	0.40 <sup>a</sup>
	(0.14)	(0.4)	(0.15)	(0.12)
<i>OECD_Oceania<sub>ijt</sub></i>	1.007 <sup>a</sup>	1.53 <sup>a</sup>	1.01 <sup>a</sup>	1.94 <sup>a</sup>
	(0.20)	(0.44)	(0.34)	(0.58)
<i>SSA_Colony<sub>ijt</sub></i>	1.04 <sup>a</sup>	1.11 <sup>a</sup>	0.77 <sup>a</sup>	0.87 <sup>a</sup>
	(0.15)	(0.15)	(0.23)	(0.18)
<i>North-Africa_Colony<sub>ijt</sub></i>	0.87 <sup>a</sup>	0.89 <sup>a</sup>	-0.58	0.85
	(0.18)	(0.23)	(0.41)	(0.55)
<i>Asia_Colony<sub>ijt</sub></i>	-0.34 <sup>c</sup>	0.84 <sup>b</sup>	-0.36	0.50
	(0.19)	(0.42)	(0.30)	(0.58)
<i>South-America_Colony<sub>ijt</sub></i>	0.27	1.03 <sup>a</sup>	-0.07	1.31 <sup>b</sup>
	(0.18)	(0.36)	(0.33)	(0.58)
<i>Constant</i>	12.51 <sup>a</sup>	-32.86 <sup>a</sup>	0.75 <sup>a</sup>	
	(0.13)	(0.49)	(0.001)	
Observations	818071	731622	818071	1073038
Country-year fixed effects	Yes	No	Yes	No
Country-pair fixed effects and time dummies	No	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.7	0.83	0.85	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 4.4: Effects of diplomatic ties with China on Taiwanese bilateral trade

	MFE	DFE	MFE & DFE	PPML
<i>ln GDP<sub>it</sub></i>		0.77 <sup>a</sup>		0.81 <sup>a</sup>
		(0.01)		(0.03)
<i>ln GDP<sub>jt</sub></i>		0.65 <sup>a</sup>		0.72 <sup>a</sup>
		(0.01)		(0.02)
<i>ln Population<sub>it</sub></i>		-0.48 <sup>a</sup>		-0.19 <sup>b</sup>
		(0.03)		(0.08)
<i>ln Population<sub>jt</sub></i>		0.39 <sup>a</sup>		-0.06
		(0.03)		(0.07)
<i>ln Distance<sub>ij</sub></i>	-1.38 <sup>a</sup>			
	(0.01)			
<i>ln Language<sub>ij</sub></i>	0.77 <sup>a</sup>			
	(0.03)			
<i>ln Contiguity<sub>ij</sub></i>	0.56 <sup>a</sup>			
	(0.07)			
<b>Diplomatic ties with China (Exports to Taiwan)</b>				
<i>OECD_EU<sub>ijt</sub></i>	-0.39	1.21 <sup>a</sup>	0.29	0.29
	(0.23)	(0.17)	(0.25)	(0.21)
<i>OECD_North-America<sub>ijt</sub></i>	1.06 <sup>a</sup>	1.03 <sup>a</sup>	-0.01	0.27 <sup>a</sup>
	(0.31)	(0.18)	(0.28)	(0.05)
<i>OECD_Asia<sub>ijt</sub></i>	-0.96 <sup>a</sup>	0.09	-1.05 <sup>a</sup>	-0.29
	(0.28)	(0.07)	(0.28)	(0.22)
<i>OECD_Middle-East<sub>ijt</sub></i>	0.99 <sup>a</sup>	1.33 <sup>a</sup>	-0.24	1.49 <sup>a</sup>
	(0.19)	(0.01)	(0.24)	(0.05)
<i>OECD_Oceania<sub>ijt</sub></i>	1.91 <sup>a</sup>	0.87 <sup>a</sup>	0.94 <sup>a</sup>	0.35 <sup>a</sup>
	(0.38)	(0.19)	(0.27)	(0.09)
<i>SSA_Colony<sub>ijt</sub></i>	0.09	0.77	0.80 <sup>c</sup>	1.09 <sup>a</sup>
	(0.36)	(0.58)	(0.48)	(0.4)
<i>North-Africa_Colony<sub>ijt</sub></i>	-0.86	-1.1	-1.09	2.1 <sup>a</sup>
	(0.55)	(0.31)	(0.30)	(0.5)
<i>Asia_Colony<sub>ijt</sub></i>	-1.02 <sup>a</sup>	0.66 <sup>a</sup>	-0.37	0.35 <sup>a</sup>
	(0.30)	(0.20)	(0.29)	(0.04)
<i>South-America_Colony<sub>ijt</sub></i>	-2.008 <sup>a</sup>	-3.12 <sup>a</sup>	-3.79 <sup>a</sup>	-2.52 <sup>a</sup>
	(0.56)	(0.03)	(0.32)	(0.07)
<b>Diplomatic ties with China (Taiwanese exports)</b>				
<i>OECD_EU<sub>ijt</sub></i>	-0.48 <sup>b</sup>	2.03 <sup>a</sup>	0.87 <sup>a</sup>	0.79 <sup>a</sup>
	(0.19)	(0.11)	(0.26)	(0.16)
<i>OECD_North-America<sub>ijt</sub></i>	1.58 <sup>a</sup>	2.01 <sup>a</sup>	0.48	0.41 <sup>a</sup>
	(0.20)	(0.05)	(0.30)	(0.05)
<i>OECD_Asia<sub>ijt</sub></i>	-1.40 <sup>a</sup>	-0.02	-1.37 <sup>a</sup>	-0.10
	(0.20)	(0.12)	(0.27)	(0.22)
<i>OECD_Middle-East<sub>ijt</sub></i>	-0.72 <sup>a</sup>	2.59 <sup>a</sup>	0.53 <sup>b</sup>	3.83 <sup>a</sup>
	(0.17)	(0.02)	(0.22)	(0.06)
<i>OECD_Oceania<sub>ijt</sub></i>	1.64 <sup>a</sup>	1.40 <sup>a</sup>	1.43 <sup>a</sup>	1.36 <sup>a</sup>
	(0.34)	(0.47)	(0.47)	(0.08)
<i>SSA_Colony<sub>ijt</sub></i>	0.14	-0.40	-0.81 <sup>b</sup>	-0.93 <sup>c</sup>
	(0.24)	(0.41)	(0.35)	(0.48)
<i>North-Africa_Colony<sub>ijt</sub></i>	0.21	0.21 <sup>a</sup>	0.25	-0.17 <sup>a</sup>
	(0.50)	(0.02)	(0.55)	(0.06)
<i>Asia_Colony<sub>ijt</sub></i>	-0.68 <sup>b</sup>	0.83 <sup>a</sup>	-0.01	-0.17 <sup>b</sup>
	(0.28)	(0.31)	(0.35)	(0.07)
<i>South-America_Colony<sub>ijt</sub></i>	1.05 <sup>a</sup>	0.43 <sup>b</sup>	0.10	0.09
	(0.25)	(0.21)	(0.41)	(0.26)
<i>Constant</i>	12.50 <sup>a</sup>	-32.74 <sup>a</sup>	0.74	
	(0.13)	(0.49)	(29.04)	
Observations	818071	731622	818071	1073038
Country-year fixed effects	Yes	No	Yes	No
Country-pair fixed effects and time dummies	No	Yes	Yes	Yes
R <sup>2</sup>	0.7	0.83	0.85	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 4.5: Effects of China’s recognition by the UN on Chinese trade flows over time

	MFE	DFE	MFE & DFE	PPML
<b>Vote on China’s recognition by the UN (exports to China, 5 years after)</b>				
<i>t5_UN.vote.Yes<sub>ijt</sub></i>	1.10 <sup>b</sup> (0.51)	-0.21 (0.14)	0.62 (0.46)	-0.08 (0.11)
<i>t5_UN.vote.No<sub>ijt</sub></i>	0.23 (0.68)	-1.11 <sup>b</sup> (0.50)	-0.32 (0.65)	-0.49 <sup>b</sup> (0.23)
<i>t5_UN.vote.Abs<sub>ijt</sub></i>	0.06 (0.70)	-1.008 <sup>c</sup> (0.51)	-0.09 (0.64)	-0.82 <sup>a</sup> (0.29)
<b>Vote on China’s recognition by the UN (Chinese exports, 5 years after)</b>				
<i>t5_UN.vote.Yes<sub>ijt</sub></i>	0.49 (0.34)	-0.36 <sup>a</sup> (0.09)	0.51 (0.31)	-0.40 <sup>a</sup> (0.08)
<i>t5_UN.vote.No<sub>ijt</sub></i>	-0.13 (0.41)	-0.93 <sup>a</sup> (0.26)	-0.06 (0.37)	-0.87 <sup>a</sup> (0.23)
<i>t5_UN.vote.Abs<sub>ijt</sub></i>	-0.10 (0.38)	-1.05 <sup>a</sup> (0.23)	-0.09 (0.37)	-0.79 <sup>c</sup> (0.40)
<b>Vote on China’s recognition by the UN (exports to China, 10 years after)</b>				
<i>t10_UN.vote.Yes<sub>ijt</sub></i>	1.15 <sup>b</sup> (0.56)	0.03 (0.16)	1.26 <sup>b</sup> (0.59)	-0.05 (0.08)
<i>t10_UN.vote.No<sub>ijt</sub></i>	0.62 (0.659)	-0.65 (0.40)	0.64 (0.69)	-0.30 <sup>a</sup> (0.08)
<i>t10_UN.vote.Abs<sub>ijt</sub></i>	0.67 (0.70)	-0.78 <sup>c</sup> (0.45)	0.62 (0.72)	-0.66 <sup>a</sup> (0.20)
<b>Vote on China’s recognition by the UN (Chinese exports, 10 years after)</b>				
<i>t10_UN.vote.Yes<sub>ijt</sub></i>	-0.07 (0.20)	-0.09 (0.10)	-0.01 (0.15)	-0.10 (0.10)
<i>t10_UN.vote.No<sub>ijt</sub></i>	0.06 (0.26)	-0.08 (0.19)	0.05 (0.22)	-0.35 <sup>b</sup> (0.16)
<i>t10_UN.vote.Abs<sub>ijt</sub></i>	-0.37 (0.29)	-0.51 <sup>b</sup> (0.24)	-0.38 (0.26)	-0.71 (0.51)
<b>Vote on China’s recognition by the UN (exports to China, 15 years after)</b>				
<i>t15_UN.vote.Yes<sub>ijt</sub></i>	-0.04 (0.35)	-0.22 (0.16)	-0.47 (0.39)	-0.71 <sup>a</sup> (0.20)
<i>t15_UN.vote.No<sub>ijt</sub></i>	0.05 (0.39)	0.16 (0.26)	-0.26 (0.43)	-0.41 <sup>b</sup> (0.20)
<i>t15_UN.vote.Abs<sub>ijt</sub></i>	-0.61 (0.55)	-0.25 (0.38)	-0.28 (0.49)	-0.78 <sup>b</sup> (0.30)
<b>Vote on China’s recognition by the UN (Chinese exports, 15 years after)</b>				
<i>t15_UN.vote.Yes<sub>ijt</sub></i>	0.60 <sup>b</sup> (0.24)	-0.20 <sup>b</sup> (0.09)	-0.10 (0.18)	-1.13 <sup>a</sup> (0.16)
<i>t15_UN.vote.No<sub>ijt</sub></i>	0.44 (0.30)	-0.65 <sup>a</sup> (0.23)	-0.24 (0.24)	-1.21 <sup>a</sup> (0.39)
<i>t15_UN.vote.Abs<sub>ijt</sub></i>	0.35 (0.38)	-0.33 (0.32)	0.05 (0.32)	-0.54 (0.63)
<i>Constant</i>	12.49 <sup>a</sup> (0.13)	-32.75 <sup>a</sup> (0.49)	0.75 <sup>a</sup> (0.0007)	
Observations	818071	731622	818071	1073038
Country-year fixed effects	Yes	No	Yes	No
Country-pair fixed effects and time dummies	No	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.70	0.83	0.85	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 4.6: Effects of China's recognition by the UN on Taiwanese trade flows over time

	MFE	DFE	MFE & DFE	PPML
<b>Vote on China's recognition by the UN (exports to Taiwan, 5 years after)</b>				
<i>t5_UN.vote.Yes<sub>ijt</sub></i>	-0.25 (0.37)	-0.21 (0.18)	-0.19 (0.42)	-0.53 <sup>b</sup> (0.25)
<i>t5_UN.vote.No<sub>ijt</sub></i>	0.14 (0.39)	-0.02 (0.21)	0.06 (0.44)	0.08 (0.15)
<i>t5_UN.vote.Abs<sub>ijt</sub></i>	0.26 (0.40)	-0.28 (0.24)	-0.03 (0.46)	0.46 <sup>c</sup> (0.26)
<b>Vote on China's recognition by the UN (Taiwanese exports, 5 years after)</b>				
<i>t5_UN.vote.Yes<sub>ijt</sub></i>	0.02 (0.40)	-0.43 <sup>a</sup> (0.13)	-0.003 (0.33)	-0.12 (0.09)
<i>t5_UN.vote.No<sub>ijt</sub></i>	-0.02 (0.40)	-0.43 <sup>a</sup> (0.13)	-0.04 (0.34)	-0.01 (0.09)
<i>t5_UN.vote.Abs<sub>ijt</sub></i>	-0.11 (0.42)	-0.53 <sup>a</sup> (0.19)	-0.03 (0.36)	0.02 (0.24)
<b>Vote on China's recognition by the UN (exports to Taiwan, 10 years after)</b>				
<i>t10_UN.vote.Yes<sub>ijt</sub></i>	-1.29 (0.98)	-0.47 <sup>b</sup> (0.21)	-0.88 (0.60)	0.16 (0.22)
<i>t10_UN.vote.No<sub>ijt</sub></i>	-1.11 (0.94)	0.10 (0.27)	-0.40 (0.65)	0.11 (0.07)
<i>t10_UN.vote.Abs<sub>ijt</sub></i>	-0.39 (1.03)	0.47 (0.29)	-0.11 (0.73)	0.39 <sup>a</sup> (0.11)
<b>Vote on China's recognition by the UN (Taiwanese exports, 10 years after)</b>				
<i>t10_UN.vote.Yes<sub>ijt</sub></i>	-1.08 (0.15)	-0.44 <sup>b</sup> (0.19)	-1.18 <sup>a</sup> (0.39)	-0.12 (0.07)
<i>t10_UN.vote.No<sub>ijt</sub></i>	-0.26 (0.84)	-0.22 (0.23)	-0.95 <sup>b</sup> (0.42)	-0.26 <sup>a</sup> (0.06)
<i>t10_UN.vote.Abs<sub>ijt</sub></i>	-0.007 (0.81)	0.44 <sup>a</sup> (0.16)	-0.43 (0.42)	0.34 <sup>b</sup> (0.16)
<b>Vote on China's recognition by the UN (exports to Taiwan, 15 years after)</b>				
<i>t15_UN.vote.Yes<sub>ijt</sub></i>	1.52 (1.13)	0.62 <sup>a</sup> (0.23)	0.79 <sup>c</sup> (0.40)	-0.05 (0.20)
<i>t15_UN.vote.No<sub>ijt</sub></i>	2.06 <sup>c</sup> (1.08)	0.71 <sup>a</sup> (0.23)	0.74 (0.50)	0.04 (0.11)
<i>t15_UN.vote.Abs<sub>ijt</sub></i>	1.21 (1.14)	0.31 (0.24)	0.82 (0.63)	-0.39 <sup>a</sup> (0.04)
<b>Vote on China's recognition by the UN (Taiwanese exports, 15 years after)</b>				
<i>t15_UN.vote.Yes<sub>ijt</sub></i>	1.52 <sup>c</sup> (0.84)	0.80 <sup>a</sup> (0.18)	1.16 <sup>a</sup> (0.40)	0.01 (0.13)
<i>t15_UN.vote.No<sub>ijt</sub></i>	1.69 <sup>c</sup> (0.92)	0.82 <sup>a</sup> (0.29)	1.26 <sup>a</sup> (0.45)	0.39 <sup>a</sup> (0.05)
<i>t15_UN.vote.Abs<sub>ijt</sub></i>	1.37 <sup>c</sup> (0.77)	0.03 (0.20)	0.72 (0.45)	-0.34 <sup>a</sup> (0.13)
<i>Constant</i>	12.49 <sup>a</sup> (0.13)	-32.89 <sup>a</sup> (0.49)	0.75 <sup>a</sup> (0.0004)	
Observations	818071	731622	818071	1073038
Country-year fixed effects	Yes	No	Yes	No
Country-pair fixed effects and time dummies	No	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.70	0.83	0.85	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 4.7: Effects of diplomatic ties with China on Chinese bilateral trade over time

	MFE	DFE	MFE & DFE	PPML
<b>Diplomatic ties with China (Exports to China, 5 years after)</b>				
<i>t5_OECD_EU<sub>ijt</sub></i>	-0.01 (0.14)	-0.57 <sup>a</sup> (0.13)	-0.03 (0.13)	-0.46 <sup>a</sup> (0.09)
<i>t5_OECD_North-America<sub>ijt</sub></i>	0.18 (0.27)	-0.06 (0.04)	0.20 (0.22)	-0.13 <sup>a</sup> (0.01)
<i>t5_OECD_Asia<sub>ijt</sub></i>	-0.07 (0.30)	-0.23 (0.24)	0.01 (0.19)	-0.27 <sup>c</sup> (0.14)
<i>t5_OECD_Middle-East<sub>ijt</sub></i>	1.04 <sup>a</sup> (0.19)	0.29 <sup>a</sup> (0.01)	0.91 <sup>a</sup> (0.17)	0.43 <sup>a</sup> (0.02)
<i>t5_OECD_Oceania<sub>ijt</sub></i>	-0.61 (0.40)	-0.67 <sup>b</sup> (0.33)	-0.60 (0.37)	-0.59 <sup>a</sup> (0.63)
<i>t5_SSA_Colony<sub>ijt</sub></i>	-0.48 (0.35)	-0.22 (0.35)	-0.12 (0.33)	-0.34 (0.38)
<i>t5_North-Africa_Colony<sub>ijt</sub></i>	-0.26 (0.37)	-0.69 (0.47)	-0.63 (0.42)	0.12 (0.18)
<i>t5_Asia_Colony<sub>ijt</sub></i>	0.09 (0.35)	-0.50 <sup>c</sup> (0.29)	-0.0001 (0.33)	-0.25 (0.07)
<i>t5_South-America_Colony<sub>ijt</sub></i>	1.10 (0.95)	0.81 (0.87)	1.04 (0.91)	3.07 <sup>a</sup> (0.60)
<b>Diplomatic ties with China (Chinese exports, 5 years after)</b>				
<i>t5_OECD_EU<sub>ijt</sub></i>	-0.10 (0.14)	-0.69 <sup>a</sup> (0.13)	-0.05 (0.14)	-0.67 <sup>a</sup> (0.06)
<i>t5_OECD_North-America<sub>ijt</sub></i>	-0.49 <sup>c</sup> (0.19)	-0.78 <sup>a</sup> (0.17)	-0.41 (0.33)	-0.97 <sup>a</sup> (0.02)
<i>t5_OECD_Asia<sub>ijt</sub></i>	0.03 (0.19)	-0.33 (0.36)	-0.02 (0.13)	-0.33 (0.21)
<i>t5_OECD_Middle-East<sub>ijt</sub></i>	2.71 <sup>a</sup> - (0.17)	0.78 <sup>a</sup> (0.17)	2.69 <sup>a</sup> (0.16)	2.61 <sup>a</sup> (0.01)
<i>t5_OECD_Oceania<sub>ijt</sub></i>	0.40 <sup>c</sup> (0.23)	1.99 <sup>a</sup> (0.01)	0.48 <sup>b</sup> (0.23)	-0.55 <sup>a</sup> (0.10)
<i>t5_SSA_Colony<sub>ijt</sub></i>	-0.15 (0.18)	-0.41 <sup>a</sup> (0.15)	-0.04 (0.16)	-0.44 <sup>b</sup> (0.21)
<i>t5_North-Africa_Colony<sub>ijt</sub></i>	-0.04 (0.20)	-0.32 <sup>b</sup> (0.14)	-0.07 (0.19)	-0.03 (0.09)
<i>t5_Asia_Colony<sub>ijt</sub></i>	-0.26 (0.19)	-0.46 <sup>b</sup> (0.20)	-0.22 (0.18)	0.03 (0.06)
<i>t5_South-America_Colony<sub>ijt</sub></i>	0.67 <sup>c</sup> (0.35)	0.24 (0.30)	0.51 (0.31)	0.69 (0.52)

	MFE	DFE	MFE & DFE	PPML
<b>Diplomatic ties with China (Exports to China, 10 years after)</b>				
<i>t10_OECD_EU<sub>ijt</sub></i>	0.04 (0.25)	0.12 (0.30)	0.19 (0.25)	-0.42 <sup>a</sup> (0.04)
<i>t10_OECD_North-America<sub>ijt</sub></i>	-0.26 (0.19)	-0.42 <sup>b</sup> (0.16)	-0.18 <sup>c</sup> (0.11)	-0.24 <sup>a</sup> (0.03)
<i>t10_OECD_Asia<sub>ijt</sub></i>	0.40 (0.53)	-0.26 (0.19)	0.31 (0.45)	-0.10 (0.14)
<i>t10_OECD_Middle-East<sub>ijt</sub></i>	-0.40 <sup>c</sup> (0.21)	-1.62 <sup>a</sup> (0.01)	-0.32 (0.20)	-1.21 <sup>a</sup> (0.02)
<i>t10_OECD_Oceania<sub>ijt</sub></i>	0.72 <sup>c</sup> (0.38)	0.33 (0.35)	0.52 (0.37)	0.42 <sup>a</sup> (0.13)
<i>t10_SSA_Colony<sub>ijt</sub></i>	-0.47 (0.38)	-0.50 (0.40)	-0.51 (0.40)	-0.67 <sup>b</sup> (0.31)
<i>t10_North-Africa_Colony<sub>ijt</sub></i>	-0.27 (0.35)	-0.11 (0.20)	-0.34 (0.26)	0.003 (0.03)
<i>t10_Asia_Colony<sub>ijt</sub></i>	-0.57 <sup>c</sup> (0.34)	-0.39 (0.35)	-0.34 (0.33)	-0.46 <sup>a</sup> (0.05)
<i>t10_South-America_Colony<sub>ijt</sub></i>	0.15 (1.01)	0.38 (0.99)	0.16 (1.04)	-1.53 (1.18)
<b>Diplomatic ties with China (Chinese exports, 10 years after)</b>				
<i>t10_OECD_EU<sub>ijt</sub></i>	-0.32 <sup>b</sup> (0.14)	-0.24 <sup>c</sup> (0.13)	-0.19 <sup>c</sup> (0.10)	-0.32 <sup>a</sup> (0.05)
<i>t10_OECD_North-America<sub>ijt</sub></i>	-0.36 <sup>b</sup> (0.17)	-0.73 <sup>a</sup> (0.20)	-0.32 <sup>c</sup> (0.16)	-0.98 <sup>a</sup> (0.02)
<i>t10_OECD_Asia<sub>ijt</sub></i>	0.13 (0.19)	-0.38 <sup>b</sup> (0.18)	0.09 (0.13)	-0.05 <sup>b</sup> (0.02)
<i>t10_OECD_Middle-East<sub>ijt</sub></i>	-2.80 <sup>a</sup> (0.16)	-3.56 <sup>a</sup> (0.01)	-2.64 <sup>a</sup> (0.16)	-3.84 <sup>a</sup> (0.02)
<i>t10_OECD_Oceania<sub>ijt</sub></i>	0.04 (0.34)	-0.19 (0.15)	-0.08 (0.21)	0.32 <sup>a</sup> (0.03)
<i>t10_SSA_Colony<sub>ijt</sub></i>	0.09 (0.15)	-0.05 (0.12)	0.12 (0.13)	-0.66 <sup>b</sup> (0.31)
<i>t10_North-Africa_Colony<sub>ijt</sub></i>	-0.13 (0.21)	-0.37 (0.30)	-0.03 (0.22)	0.005 (0.03)
<i>t10_Asia_Colony<sub>ijt</sub></i>	0.07 (0.31)	0.11 (0.14)	0.21 (0.19)	-0.38 <sup>a</sup> (0.02)
<i>t10_South-America_Colony<sub>ijt</sub></i>	0.12 (0.19)	-0.05 (0.13)	0.08 (0.17)	-1.52 (1.18)

	MFE	DFE	MFE & DFE	PPML
<b>Diplomatic ties with China (Exports to China, 15 years after)</b>				
<i>t15_OECD_EU<sub>ijt</sub></i>	-0.55 <sup>b</sup> (0.21)	-0.005 (0.27)	-0.05 (0.20)	0.47 (0.33)
<i>t15_OECD_North-America<sub>ijt</sub></i>	1.16 <sup>a</sup> (0.26)	0.97 <sup>a</sup> (0.19)	0.72 <sup>a</sup> (0.09)	0.12 <sup>b</sup> (0.05)
<i>t15_OECD_Asia<sub>ijt</sub></i>	-1.49 <sup>a</sup> (0.25)	0.79 <sup>b</sup> (0.33)	-0.01 (0.27)	0.09 (0.09)
<i>t15_OECD_Middle-East<sub>ijt</sub></i>	0.64 <sup>a</sup> (0.19)	0.50 <sup>a</sup> (0.01)	1.43 <sup>a</sup> (0.16)	-0.08 <sup>b</sup> (0.03)
<i>t15_OECD_Oceania<sub>ijt</sub></i>	1.04 <sup>c</sup> (0.56)	0.23 (0.45)	-0.14 (0.43)	-0.49 <sup>a</sup> (0.14)
<i>t15_SSA_Colony<sub>ijt</sub></i>	1.10 <sup>a</sup> (0.34)	-0.008 (0.35)	0.40 (0.34)	-0.94 <sup>a</sup> (0.18)
<i>t15_North-Africa_Colony<sub>ijt</sub></i>	1.22 <sup>c</sup> (0.65)	0.22 (0.50)	1.20 <sup>b</sup> (0.50)	-0.17 (0.50)
<i>t15_Asia_Colony<sub>ijt</sub></i>	-0.16 (0.44)	0.65 (0.43)	0.76 <sup>c</sup> (0.40)	0.06 (0.07)
<i>t15_South-America_Colony<sub>ijt</sub></i>	-1.88 <sup>a</sup> (0.62)	-0.52 (0.80)	-1.99 (0.89)	-1.15 (0.76)
<b>Diplomatic ties with China (Chinese exports, 15 years after)</b>				
<i>t15_OECD_EU<sub>ijt</sub></i>	-0.63 <sup>a</sup> (0.16)	-0.11 (0.25)	-0.12 (0.14)	-1.26 <sup>a</sup> (0.09)
<i>t15_OECD_North-America<sub>ijt</sub></i>	0.42 (0.25)	1.02 (0.85)	0.60 (0.14)	0.23 <sup>a</sup> (0.08)
<i>t15_OECD_Asia<sub>ijt</sub></i>	-1.76 <sup>a</sup> (0.29)	0.55 <sup>a</sup> (0.10)	-0.06 (0.12)	-0.18 (0.16)
<i>t15_OECD_Middle-East<sub>ijt</sub></i>	-1.41 <sup>a</sup> (0.18)	-1.45 <sup>a</sup> (0.01)	-0.63 <sup>a</sup> (0.14)	-2.35 <sup>a</sup> (0.03)
<i>t15_OECD_Oceania<sub>ijt</sub></i>	0.31 (0.36)	0.21 (0.26)	-0.29 (0.26)	-1.61 <sup>a</sup> (0.12)
<i>t15_SSA_Colony<sub>ijt</sub></i>	1.29 <sup>a</sup> (0.19)	0.11 (0.12)	0.91 <sup>a</sup> (0.15)	-0.51 <sup>a</sup> (0.14)
<i>t15_North-Africa_Colony<sub>ijt</sub></i>	1.09 <sup>a</sup> (0.39)	-0.56 <sup>a</sup> (0.14)	0.40 (0.37)	-0.97 <sup>a</sup> (0.23)
<i>t15_Asia_Colony<sub>ijt</sub></i>	-0.31 (0.28)	-0.16 (0.26)	0.12 (0.24)	0.03 (0.07)
<i>t15_South-America_Colony<sub>ijt</sub></i>	-0.20 (0.25)	0.73 <sup>b</sup> (0.35)	-0.24 (0.27)	-1.72 <sup>a</sup> (0.54)
<i>Constant</i>	12.50 <sup>a</sup> (0.13)	-32.84 <sup>a</sup> (0.49)	0.75 <sup>a</sup> (0.0002)	
Observations	818071	731622	818071	1073038
Country-year fixed effects	Yes	No	Yes	No
Country-pair fixed effects and time dummies	No	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.70	0.83	0.85	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 4.8: Effects of diplomatic ties with China on Taiwanese bilateral trade over time

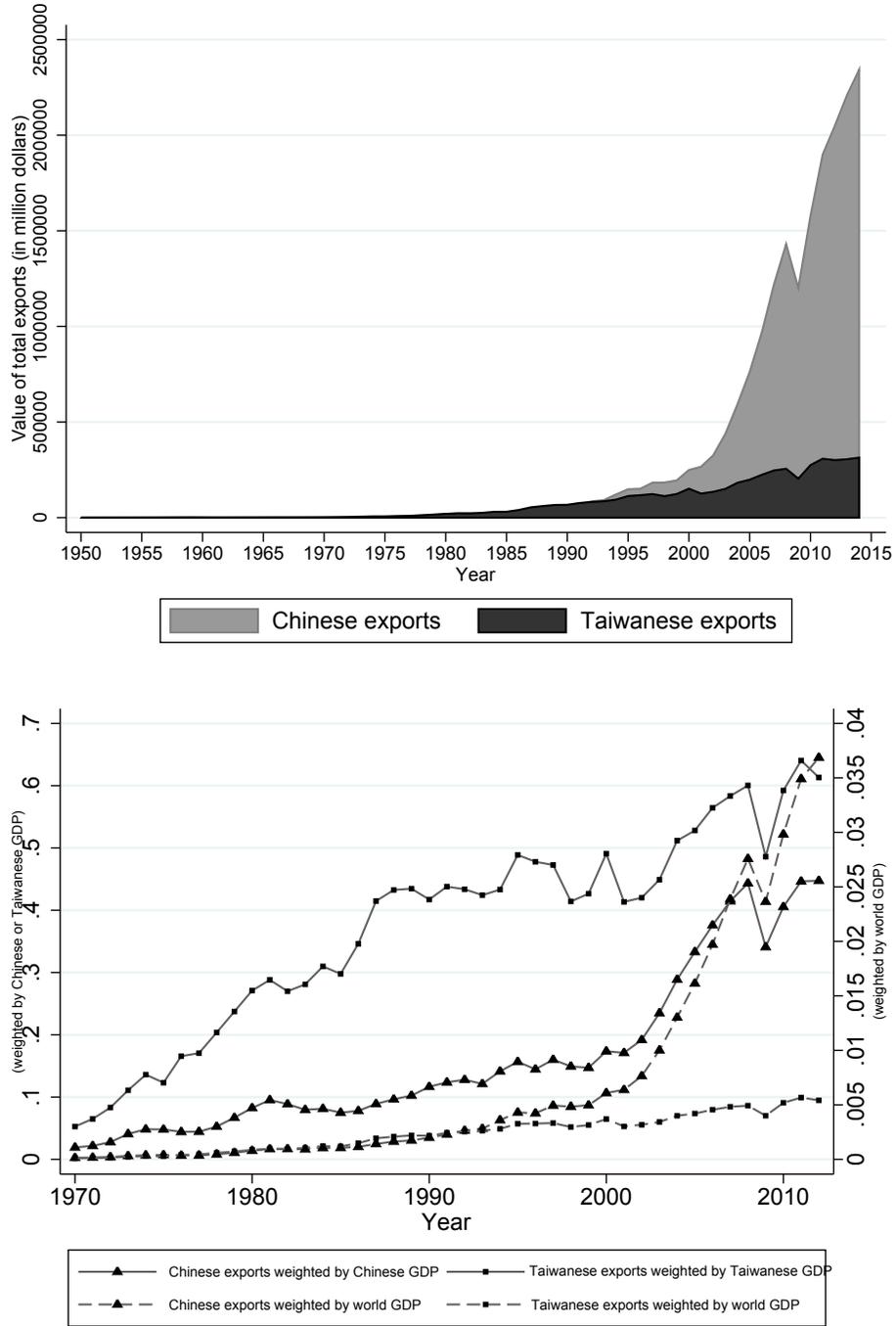
	MFE	DFE	MFE & DFE	PPML
<b>Diplomatic ties with China (Exports to Taiwan, 5 years after)</b>				
<i>t5_OECD_EU<sub>ijt</sub></i>	0.06 (0.09)	-0.25 <sup>b</sup> (0.27)	0.05 (0.14)	0.17 (0.11)
<i>t5_OECD_North-America<sub>ijt</sub></i>	-0.50 <sup>a</sup> (0.15)	-0.35 (0.30)	-0.48 <sup>a</sup> (0.15)	-0.04 <sup>b</sup> (0.01)
<i>t5_OECD_Asia<sub>ijt</sub></i>	0.55 (0.54)	0.37 <sup>b</sup> (0.15)	0.42 (0.26)	0.06 (0.24)
<i>t5_OECD_Middle-East<sub>ijt</sub></i>	-0.80 <sup>a</sup> (0.18)	-0.95 <sup>a</sup> (0.01)	-0.76 <sup>a</sup> (0.17)	-0.14 <sup>a</sup> (0.01)
<i>t5_OECD_Oceania<sub>ijt</sub></i>	-0.90 (0.79)	-0.32 (0.54)	-0.19 (0.51)	-0.43 <sup>a</sup> (0.08)
<i>t5_SSA_Colony<sub>ijt</sub></i>	-0.29 (0.60)	0.59 (0.79)	0.39 (0.73)	-0.15 (0.85)
<i>t5_North-Africa_Colony<sub>ijt</sub></i>	-0.91 <sup>c</sup> (0.20)	-0.72 <sup>a</sup> (0.01)	-0.71 <sup>a</sup> (0.20)	-0.37 <sup>a</sup> (0.01)
<i>t5_Asia_Colony<sub>ijt</sub></i>	0.55 (0.81)	0.08 (0.54)	-0.10 (0.44)	0.33 <sup>a</sup> (0.07)
<i>t5_South-America_Colony<sub>ijt</sub></i>	-2.53 <sup>b</sup> (1.01)	-3.11 <sup>a</sup> (1.08)	-3.04 <sup>a</sup> (0.81)	-2.69 <sup>a</sup> (0.18)
<b>Diplomatic ties with China (Taiwanese exports, 5 years after)</b>				
<i>t5_OECD_EU<sub>ijt</sub></i>	-0.23 (0.20)	-0.71 <sup>a</sup> (0.20)	-0.12 (0.20)	-0.07 (0.07)
<i>t5_OECD_North-America<sub>ijt</sub></i>	-0.04 (0.23)	-0.25 <sup>a</sup> (0.03)	0.01 (0.19)	-0.15 <sup>a</sup> (0.01)
<i>t5_OECD_Asia<sub>ijt</sub></i>	0.33 (0.30)	0.21 <sup>b</sup> (0.08)	0.16 (0.25)	0.14 (0.17)
<i>t5_OECD_Middle-East<sub>ijt</sub></i>	0.38 <sup>b</sup> (0.19)	0.20 <sup>a</sup> (0.01)	0.49 <sup>a</sup> (0.17)	0.22 <sup>a</sup> (0.01)
<i>t5_OECD_Oceania<sub>ijt</sub></i>	-0.06 (0.42)	0.28 (0.41)	1.02 <sup>b</sup> (0.40)	-0.44 <sup>b</sup> (0.17)
<i>t5_SSA_Colony<sub>ijt</sub></i>	0.30 (0.38)	0.24 (0.23)	0.33 (0.26)	0.03 (0.18)
<i>t5_North-Africa_Colony<sub>ijt</sub></i>	-0.01 (1.06)	-0.27 (0.69)	-0.80 (1.08)	-0.13 (0.70)
<i>t5_Asia_Colony<sub>ijt</sub></i>	-0.50 (0.40)	-0.89 <sup>b</sup> (0.41)	-1.33 <sup>a</sup> (0.43)	0.09 (0.11)
<i>t5_South-America_Colony<sub>ijt</sub></i>	0.67 <sup>b</sup> (0.34)	0.26 (0.34)	0.30 (0.30)	0.59 <sup>c</sup> (0.33)

	MFE	DFE	MFE & DFE	PPML
<b>Diplomatic ties with China (Exports to Taiwan, 10 years after)</b>				
<i>t10_OECD_EU<sub>ijt</sub></i>	-0.34 (0.31)	0.19 (0.33)	-0.34 (0.23)	-0.24 <sup>a</sup> (0.06)
<i>t10_OECD_North-America<sub>ijt</sub></i>	-0.16 (0.29)	-0.10 <sup>a</sup> (0.08)	0.04 (0.12)	-0.02 (0.01)
<i>t10_OECD_Asia<sub>ijt</sub></i>	-0.06 (0.15)	0.07 <sup>a</sup> (0.01)	-0.15 (0.13)	0.10 <sup>a</sup> (0.02)
<i>t10_OECD_Middle-East<sub>ijt</sub></i>	1.57 <sup>a</sup> (0.24)	-0.17 <sup>a</sup> (0.01)	0.73 <sup>a</sup> (0.20)	-0.55 <sup>a</sup> (0.04)
<i>t10_OECD_Oceania<sub>ijt</sub></i>	-0.73 (0.66)	-0.25 (0.39)	-0.19 (0.45)	-0.21 <sup>b</sup> (0.08)
<i>t10_SSA_Colony<sub>ijt</sub></i>	-0.29 (0.54)	-0.37 (0.51)	-0.42 (0.52)	-0.78 (0.72)
<i>t10_North-Africa_Colony<sub>ijt</sub></i>	2.90 <sup>a</sup> (0.40)	2.14 <sup>a</sup> (0.28)	2.61 <sup>a</sup> (0.32)	2.28 <sup>a</sup> (0.06)
<i>t10_Asia_Colony<sub>ijt</sub></i>	0.13 (0.44)	-0.04 (0.38)	-0.24 (0.38)	-0.06 (0.08)
<i>t10_South-America_Colony<sub>ijt</sub></i>	2.79 <sup>a</sup> (0.93)	3.72 <sup>a</sup> (1.21)	-1.99 (0.95)	2.29 <sup>a</sup> (0.24)
<b>Diplomatic ties with China (Taiwanese exports, 10 years after)</b>				
<i>t10_OECD_EU<sub>ijt</sub></i>	-0.33 (0.45)	0.32 (0.47)	0.02 (0.35)	-0.17 <sup>c</sup> (0.09)
<i>t10_OECD_North-America<sub>ijt</sub></i>	-0.01 (0.23)	0.44 <sup>a</sup> (0.12)	0.30 (0.34)	0.49 <sup>a</sup> (0.02)
<i>t10_OECD_Asia<sub>ijt</sub></i>	-0.15 (0.17)	-0.14 <sup>a</sup> (0.01)	-0.11 (0.14)	-0.12 <sup>a</sup> (0.02)
<i>t10_OECD_Middle-East<sub>ijt</sub></i>	-1.91 <sup>a</sup> (0.26)	-2.14 <sup>a</sup> (0.01)	0.30 (0.34)	-2.85 <sup>a</sup> (0.04)
<i>t10_OECD_Oceania<sub>ijt</sub></i>	-0.43 (0.70)	-0.82 (0.54)	-1.44 <sup>a</sup> (0.19)	0.03 (0.19)
<i>t10_SSA_Colony<sub>ijt</sub></i>	0.65 <sup>c</sup> (0.35)	0.15 (0.21)	0.18 (0.21)	0.27 (0.19)
<i>t10_North-Africa_Colony<sub>ijt</sub></i>	1.15 <sup>c</sup> (0.67)	0.95 <sup>b</sup> (0.44)	1.54 <sup>a</sup> (0.40)	1.22 <sup>b</sup> (0.59)
<i>t10_Asia_Colony<sub>ijt</sub></i>	-0.26 (0.46)	0.27 (0.39)	0.07 (0.38)	-0.27 <sup>b</sup> (0.11)
<i>t10_South-America_Colony<sub>ijt</sub></i>	-0.17 (0.35)	0.03 (0.27)	-0.09 (0.30)	-0.002 (0.30)

	MFE	DFE	MFE & DFE	PPML
<b>Diplomatic ties with China (Exports to Taiwan, 15 years after)</b>				
<i>t15_OECD_EU<sub>ijt</sub></i>	-0.47 (0.36)	-0.12 (0.38)	-0.13 (0.17)	-0.12 <sup>a</sup> (0.02)
<i>t15_OECD_North-America<sub>ijt</sub></i>	1.16 <sup>b</sup> (0.52)	0.62 <sup>a</sup> (0.08)	-0.25 (0.16)	0.05 <sup>b</sup> (0.02)
<i>t15_OECD_Asia<sub>ijt</sub></i>	-1.42 <sup>a</sup> (0.52)	0.12 <sup>a</sup> (0.02)	-0.86 <sup>a</sup> (0.22)	0.16 <sup>a</sup> (0.02)
<i>t15_OECD_Middle-East<sub>ijt</sub></i>	-0.02 (0.18)	0.84 (0.50)	0.08 (0.33)	0.63 (0.45)
<i>t15_OECD_Oceania<sub>ijt</sub></i>	2.17 <sup>a</sup> (0.52)	0.89 <sup>a</sup> (0.25)	0.55 <sup>c</sup> (0.31)	0.17 <sup>a</sup> (0.02)
<i>t15_SSA_Colony<sub>ijt</sub></i>	0.51 (0.46)	0.88 <sup>c</sup> (0.50)	0.78 (0.52)	0.47 (0.37)
<i>t15_North-Africa_Colony<sub>ijt</sub></i>	-0.76 <sup>b</sup> (0.37)	1.04 <sup>a</sup> (0.39)	1.43 <sup>a</sup> (0.35)	0.66 <sup>a</sup> (0.08)
<i>t15_Asia_Colony<sub>ijt</sub></i>	-1.08 <sup>a</sup> (0.36)	0.001 (0.25)	-0.18 (0.26)	-0.02 (0.06)
<i>South-America_Colony<sub>ijt</sub></i>	-2.98 <sup>a</sup> (0.84)	-1.01 (1.23)	-0.93 (1.08)	0.56 <sup>a</sup> (0.16)
<b>Diplomatic ties with China (Taiwanese exports, 15 years after)</b>				
<i>t15_OECD_EU<sub>ijt</sub></i>	-0.37 (0.46)	0.20 (0.54)	-0.06 (0.42)	-0.02 (0.09)
<i>t15_OECD_North-America<sub>ijt</sub></i>	1.67 <sup>a</sup> (0.22)	1.31 <sup>a</sup> (0.15)	0.32 (0.36)	0.18 <sup>a</sup> (0.01)
<i>t15_OECD_Asia<sub>ijt</sub></i>	-1.44 <sup>a</sup> (0.34)	0.24 <sup>a</sup> (0.02)	-0.62 <sup>b</sup> (0.24)	0.34 <sup>a</sup> (0.02)
<i>t15_OECD_Middle-East<sub>ijt</sub></i>	-0.68 (0.14)	0.88 (0.40)	0.47 (0.05)	0.04 (0.02)
<i>t15_OECD_Oceania<sub>ijt</sub></i>	1.75 <sup>a</sup> (0.47)	1.61 <sup>a</sup> (0.48)	0.75 <sup>c</sup> (0.40)	0.74 <sup>a</sup> (0.22)
<i>t15_SSA_Colony<sub>ijt</sub></i>	-0.12 (0.36)	0.15 (0.23)	0.21 (0.25)	0.07 (0.48)
<i>t15_North-Africa_Colony<sub>ijt</sub></i>	0.16 (0.77)	0.03 (0.66)	0.61 (0.77)	0.01 (0.41)
<i>t15_Asia_Colony<sub>ijt</sub></i>	-0.47 (0.39)	0.05 (0.46)	0.23 (0.32)	-0.03 (0.24)
<i>t15_South-America_Colony<sub>ijt</sub></i>	0.78 <sup>c</sup> (0.44)	0.23 (0.15)	0.22 (0.20)	0.22 (0.14)
<i>Constant</i>	12.49 <sup>a</sup> (0.13)	-32.89 <sup>a</sup> (0.49)	0.75 <sup>a</sup> (0.0001)	
Observations	818071	731622	818071	1073038
Country-year fixed effects	Yes	No	Yes	No
Country-pair fixed effects and time dummies	No	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.70	0.83	0.85	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Figure 4.1: Values and weighted shares by GDP of Chinese and Taiwanese total export flows



Source: UNCTAD, author calculations.

Table 4.9: List of voting countries for the UN resolution of China recognition (1971)

Yes	Yes (continued)	No	Abstention
Afghanistan	Kuwait	Australia	Argentina
Albania	Laos	Bolivia	Bahrain
Algeria	Libya	Brazil	Barbados
Austria	Malaysia	Centra African Republic	Colombia
Belgium	Mali	Chad	Cyprus
Bhutan	Mauritania	DRC	Fiji
Botswana	Mexico	Costa Rica	Greece
Bulgaria	Mongolia	Benin	Indonesia
Burma	Morocco	Dominican Republic	Jamaica
Burundi	Nepal	El Salvador	Jordan
Bielorrussian	Netherland	Gabon	Lebanon
Cameroon	Nigeria	Gambia	Luxembourg
Canada	Norway	Guatemala	Mauritius
Sri Lanka	Pakistan	Haiti	Panama
Chile	Peru	Honduras	Qatar
Congo	Poland	Ivory Cost	Spain
Cuba	Portugal	Japan	Thailand
Czechoslovakia	Romania	Myanmar	
Yemen	Rwanda	Lesotho	
Denmark	Senegal	Liberia	
Ecuador	Sierra Leone	Madagascar	
Egypt	Singapore	Malawi	
Equatorial Guinea	Somalia	Malta	
Ethiopia	Sudan	New Zealand	
Finland	Sweden	Nicaragua	
France	Syria	Niger	
Ghana	Togo	Paraguay	
Guinea	Trinidad and Tobago	Philippines	
Guyana	Tunisia	Saudi Arabia	
Hungary	Turkey	South Africa	
Iceland	Uganda	Swaziland	
India	Ukrainia	United States	
Iran	USSR	Burkina Faso	
Iraq	United Kingdom	Uruguay	
Ireland	Tanzania	Venezuela	
Israel	Yemen		
Italy	Yugoslavia		
Kenya	Zambia		

Table 4.10: List of countries with dates of establishment and suspension of diplomatic ties with China

Countries	Establishment	Suspension	Countries	Establishment	Suspension	Countries	Establishment	Suspension
USSR	1949		Turkey	1971		Ireland	1979	
Bulgaria	1949		Iran	1971		Equator	1980	
Roumania	1949		Belgium	1971		Colombia	1980	
Hungary	1949		Peru	1971		Zimbabwe	1980	
North-Korea	1949		Lebanon	1971		Kiribati	1980	
Czech Republic	1949		Rwansa	1971		Vanuatu	1982	
Poland	1949		Senegal	1971	1996-2004	Antigua & Barbuda	1983	
Mongolia	1949		Iceland	1971		Angola	1983	
Albania	1949		Cyprus	1971		Ivoiry Cost	1983	
India	1950		Malta	1972		Lesotho	1983	1991-1993
Swiss	1950		Mexico	1972		United Arab Emirates	1984	
Vietnam	1950		Argentina	1972		Bolivia	1985	
Indonesia	1950		Great Britain	1972		Grenade	1985	
Sweden	1950		Mauritius	1972		Nicaragua	1986	1990-2012
Denmark	1950		Netherlands	1972		Belize	1987	
Burma	1950		Greece	1972		Uruguay	1988	
Liechtenstein	1950		Guyana	1972		Qatar	1988	
Finland	1950		Togo	1972		Palestine	1988	
Pakistan	1951		Japan	1972		Bahrain	1989	
Norway	1954		Germany	1972		Micronesia	1989	
Afghanistan	1955		Maldvies	1972		Namibia	1990	
Nepal	1955		Madagascar	1972		Saudi Arabia	1990	
Egypt	1956		Luxembourg	1972		Singapore	1990	
Syria	1956		Jamaica	1972		Marshall Islands	1990	
Sri Lanka	1957		Tchad	1972	1997-2005	Estonia	1991	
Cambodia	1958		Australia	1972		Latvia	1991	
Iraq	1958		New Zealand	1972		Lithuania	1991	
Morocco	1958		Spain	1973		Brunei	1991	
Algeria	1958		Burkina Faso	1973	1994-2012	Uzbekistan	1992	
Sudan	1959		Guinea Bissau	1974	1991-1997	Kazakhstan	1992	
Guinea	1959		Gabon	1974		Tajikistan	1992	
Ghana	1960		Malaya	1974		Ukraine	1992	
Cuba	1960		Trinidad & Tobago	1974		Kyrgyzstan	1992	
Mali	1960		Venezuela	1974		Turkmenistan	1992	
Somalia	1960		Niger	1974	1992-1995	Belarus	1992	
Congo	1961		Brazil	1974		Israel	1992	
Laos	1961		Gambia	1974	1996-2012	Modova	1992	
Uganda	1962		Botswana	1975		Azerbaijan	1992	
Kenay	1963		Philippines	1975		Armenia	1992	
Burundi	1963	1965-1970	Mozambique	1975		Serbia	1992	
Tunisia	1964		Thailand	1975		Georgia	1992	
France	1964		Sao Tome and Principe	1975	1998-2012	Slovenia	1992	
D.R of Congo	1964		Bangladesh	1975		Croatia	1992	
Tanzania	1964		Fiji	1975		South-Korea	1992	
Central African R.	1964	1991-1997	Samoa	1975		Eritrea	1993	
Zambia	1964		Comoros	1975		Macedonia	1993	
Benin	1964	1966-1971	Cape Verde	1976		Bosnia & Herzegovina	1995	
Mauritania	1965		Suriname	1976		Cook Islands	1997	
Canada	1970		Seychelles	1976		South Africa	1997	
Equatorial-Guinea	1970		Papua New Guinea	1976		Tonga	1998	
Ethiopia	1970		Liberia	1977	1989-2002	East Timor	2002	
Italia	1970		Jordan	1977		Nauru	2002	
Chili	1970		Barbados	1977		Montenegro	2006	
Nigeria	1971		Oman	1978		Costa Rica	2007	
Kuwait	1971		Libya	1978		Niue	2007	
Cameroon	1971		United States	1979		Malawi	2007	
Austria	1971		Djibouti	1979				
Sierra Leone	1971		Portugal	1979				

## Chapter 5

Heterogeneous effects of regional trade agreements on trade: the case of sub-Saharan Africa.

## 5.1 Introduction

“The first and most readily evident of these is the continuing growth and increasing prominence of preferential trade agreements (PTAs). In the last two decades, the number of PTAs has increased more than four-fold, to around 300 active agreements today. There is no reason to assume that PTAs will cease to grow in number or that they will not form part of the long-term tapestry of international trade relations.”<sup>1</sup> Developing countries are the main drivers of the growing evolution of RTAs thanks to the proliferation of South-South trade agreements, which reversed the trend<sup>2</sup> over the last few decades. For a long time, the economic literature has been divided about the effectiveness of South-South RTAs, particularly for African economies, for several reasons (Foroutan and Pritchett, 1993 ; Gunning, 2001 ; Masson, 2007 ; Coulibaly, 2009 ; Carrère, 2013 ; MacPhee and Sattayanuwat, 2014). According to the WTO Trade Report in 2011, “The roots of African integration lay in the effort to correct the geographical fragmentation bequeathed by colonialism. Fragmentation resulted in small markets, land-locked economies, and limited development options.” Despite the existence of several RTAs since independence, sub-Saharan Africa (SSA) economies do not seem to take full advantage of them.

The topic of RTAs heterogeneity has been little explored particularly for South-South RTAs. We know that the effects of RTAs on trade differ by the kinds of RTAs, the form, the nature of trading partners and over time. Therefore, this paper empirically examine these four dimensions in the case of SSA’s RTAs by taking into account recent approaches. Indeed, econometric specifications, the choice of RTAs and the time period significantly affect the sign, the magnitude, and the significance

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<sup>1</sup>[https://www.wto.org/english/res\\_e/booksp\\_e/anrep\\_e/world\\_trade\\_report11\\_e.pdf](https://www.wto.org/english/res_e/booksp_e/anrep_e/world_trade_report11_e.pdf)

<sup>2</sup>Actually, more than two-thirds of all regional trade agreements (RTAs) are South-South RTAs versus about one-fourth for North-South RTAs.

of RTAs estimates (Carrère, 2006 ; Baier and Bergstrand, 2007 ; Fontagné and Zignago, 2007 ; Kandogan, 2008). Moreover, “lumping all types of trade agreements together in a binary dummy variable in the gravity equation leads to measurement error of the variable of interest” (Kohl and Trojanowska, 2015).

Recent specialised literature uses more frequently the level of economic integration through the typology established by Balassa (1961)<sup>3</sup>. Several contributions showed that RTAs likely have a heterogeneous effect across trading partners (members and non-members) and across agreements based on their degree of depth (Eicher and Henn, 2011 ; Baier et al., 2014 ; Baier et al., 2015 ; Kohl et al., 2016). For Magee (2008), Vicard (2009), Roy (2010), and De Sousa (2012), whatever the degree of trade integration, these kinds of RTAs increase intra-bloc trade even if a decreasing trend appears for CUs, whereas, non-reciprocal RTAs such as GSP have a mixed effect (Ozden and Reinhardt, 2005 ; Herz and Wagner, 2011 ; Gil-Pareja et al., 2014).

Another phenomenon is added by which “most agreements are bilateral and very often overlapping, giving rise to an increasingly complex regime of different trade regulations. Critics argue that these overlapping regional trade regimes make international trade more complex and undermine WTO non-discrimination principles. However, proponents of RTAs say they can lay the groundwork for future multilateral trade rules.”<sup>4</sup> Several papers justify this specificity of RTAs through the “domino effect” developed by Baldwin (1993)<sup>5</sup>, by which outside countries fear being sidelined and affected by a trade diversion (Egger and Larch, 2008 ; Chen and Joshi, 2010 ; Cheong et al., 2015). For Lee et al. (2008), this overlapping leads to a decrease in the additional trade of members in these crisscrossing RTAs, unlike to a single RTA.

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<sup>3</sup>Preferential trade agreement (PTA), free trade agreement (FTA), custom union (CU), common market (CM), economic and monetary union (EMU), political union (PU).

<sup>4</sup>[https://www.wto.org/english/thewto\\_e/minist\\_e/mc9\\_e/brief\\_rta\\_e.htm](https://www.wto.org/english/thewto_e/minist_e/mc9_e/brief_rta_e.htm)

<sup>5</sup><http://www.nber.org/papers/w4465.pdf>

Furthermore, according to Baier and Bergstrand (2007), Baier et al. (2014), the traditional estimates of the RTA's average effects do not fully examine their real impact on trade flows because RTAs are phased-in over 5 to 10 years after their entry into force, leading to a delay in the expected effects. For instance, "a FTA which enters into force in 1960, and which is even fully "phased-in" by 1965, might still have an effect on trade flows in 1970" (Baier and Bergstrand, 2007). More specifically, lagged and lead effects of RTAs allow to better capture "phased-in" RTAs on bilateral trade flows. The authors find that after 10 years the establishment of deep RTAs leads to an increase of bilateral trade by 101% for member countries.

Aitken (1973) was one of the first economists to empirically estimate the impact of RTAs on trade flows but without a theory-consistent and robust background. We therefore perform a structural gravity model (Anderson and van Wincoop, 2003 ; Head and Mayer, 2014) by taking into account these new approaches in addition to multilateral resistance and endogeneity of RTAs through fixed effects as advised by the existing literature (Baier and Bergstrand, 2002 ; Baier and Bergstrand, 2007 ; Egger et al., 2011). From a worldwide database over the period 1948-2012, we present findings that look at the average effects of RTAs on trade flows with members (trade creation) and non-members (trade diversion) without disaggregated RTAs. We then break down the RTAs according to their form, that is, PTA, FTA, CU, reciprocal, and non-reciprocal. We also break down trade diversion according to the main outside trading partners such as OECD and China. We empirically estimate the presence or absence of the "spaghetti bowl" effect by the overlapping of SSA's RTAs. Thereafter, we employ a first-differenced panel with lagged (5 and 10-year periods) and lead (5-year periods) variables to account for "phased-in" RTAs as suggested by Baier and Bergstrand (2007), and Baier et al. (2014). We use the Poisson Pseudo-Maximum Likelihood-fixed effects model as an alternative specification to avoid omission bias

with zero trade flows and heteroskedasticity (Santos Silva and Tenreyro, 2006 ; Santos Silva and Tenreyro, 2011 ; Fally, 2015).

The remainder of this chapter is structured as follows. Section 2 provides an overview of the landscape of SSA's RTAs. Section 3 presents the existing literature about RTAs. Section 4 details the econometric approach used through the structural gravity model. Section 5 analyses consistent and robust results. Section 6 concludes the study.

## 5.2 SSA regional trade agreements: an overview of the landscape

### 5.2.1 Reciprocal trade agreements

Despite several trade and cooperation agreements between SSA countries in recent decades, the implementation of these RTAs is slow and the expected economic spillovers have been delayed. We argue that the powerlessness of governments with internal conflicts between political and ethnic factions, and also the relative economic marginalisation of Africa after independence (and with natural impediments), can explain this situation. African authorities quickly grasped the opportunities of regional integration with the removal of trade barriers and coordination policies without, however, managing to make the trade opportunities a full reality.

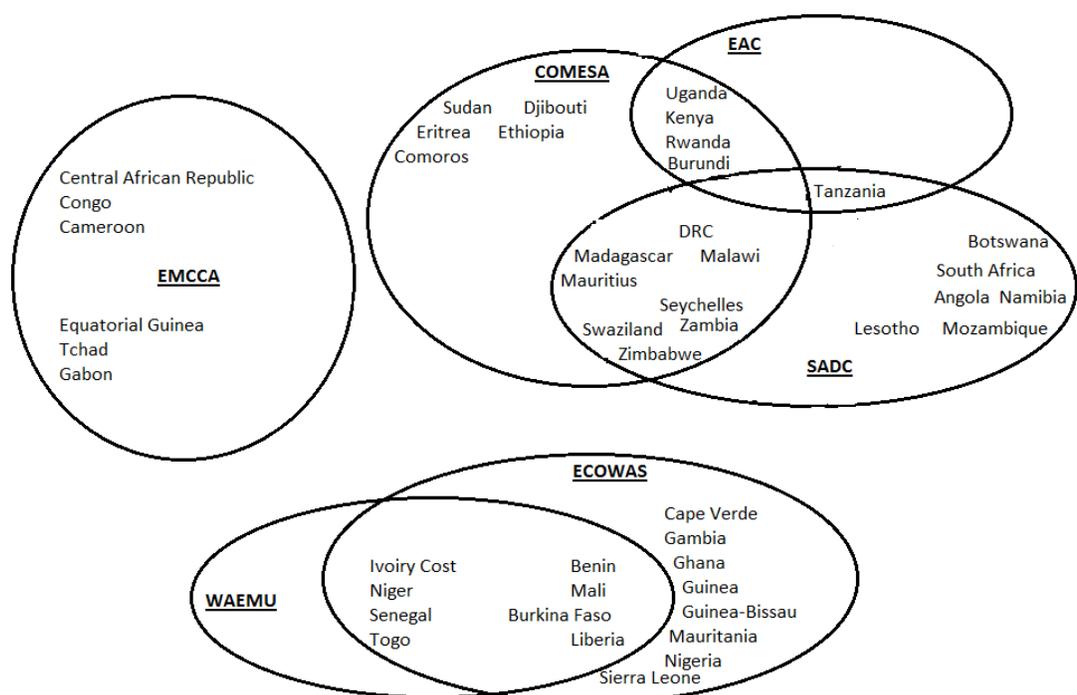
“In 2010, the 58 African countries were involved in 55 PTAs, of which 43 were South-South and 12 were North-South. PTAs have also increasingly become cross-regional. Of the 55 African PTAs, 31 are crossregional.”<sup>6</sup> This developing region did

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<sup>6</sup>[http://www.ferdi.fr/sites/www.ferdi.fr/files/publication/fichiers/wp93\\_de\\_melo\\_web\\_1.pdf](http://www.ferdi.fr/sites/www.ferdi.fr/files/publication/fichiers/wp93_de_melo_web_1.pdf). Since April 2015, WTO counts 612 notifications of regional trade agreements

not spare by the spread of PTAs (Table 10). Indeed, there exist two sets of RTAs, which overlap: reciprocal trade agreements mainly with developing countries (except for Economic Partnership Agreements<sup>7</sup>) and non-reciprocal trade agreements with developed and developing economies. The motivations to belong to these agreements differ according to the kind of agreements and the concerned partners.

Figure 5.1: “Spaghetti bowl” phenomenon for SSA’s RTAs



Source: WTO database about RTAs.

We start by focusing on RTAs between SSA countries<sup>8</sup>, where the latter coexist (RTAs) with 406 in force, where 90% are free trade agreements (FTAs) and 10% are customs unions (CUs).

<sup>7</sup>EPAs gradually replace EU-ACP agreements like Cotonou agreements.

<sup>8</sup>Economic and Community of West African States (ECOWAS), West African Economic and

ist with several regional cooperation agreements such as Indian Ocean Commission (IOC), Intergovernmental Authority on Development (IGAD), Mano River Union (MRU), Walvis Bay Corridor Group (WBCG), and Economic Community of the Great Lakes Countries (ECGLC), to name a few. Figure 1 shows the main SSA's RTAs that intersect at a different level of integration. Based on WTO studies<sup>9</sup>, amongst the RTAs retained, three are FTAs (COMESA, SADC, and ECOWAS), two are CUs (WAEMU and EAC) and only one is a PTA (EMCCA). On average, 95% of these members are also members of another RTA, which accentuates the "spaghetti bowl" phenomenon (Bhagwati et al., 1998). For instance, many issues appear because of this multi-membership: schemes of integration opposed, the lack of funding, the free-rider problem and duplicates. Other factors arise, such as the fear of trade diversion, the domino effect, and also the economic spillovers as the removal of trade barriers and the increasing market opportunities motivate countries to belong to RTAs. The fragmentation of SSA economies and the narrow markets are at the root of the launching of these regional integration schemes. To achieve these development objectives, two programs have been established : i) the New Partnership for Africa's Development (NEPAD), created in 2000, is a program developed by the African Union (AU) to promote economic and social development<sup>10</sup> from each RTA in Africa ; ii) a Minimum Integration Program (MIP) sustains the process of regional integration by strengthening cooperation<sup>11</sup> between them around the principle

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Monetary Union (WAEMU), Economic and Monetary Community of Central Africa (EMCCA), Common Market for Eastern and Southern Africa (COMESA), East African Community (EAC), Southern African Development Community (SADC).

<sup>9</sup>[https://www.wto.org/english/tratop\\_e/tpr\\_e/tpr\\_e.htm](https://www.wto.org/english/tratop_e/tpr_e/tpr_e.htm)

<sup>10</sup>8 sectors are concerned: infrastructure, education, health, agriculture, technologies, environment, energy, and trade.

<sup>11</sup>Accelerate the implementation of priority programs under the subsidiarity principle like preferential trade liberalisation, free movement of production factors. For more details: <http://www.uneca.org/publications/assessing-regional-integration-africa-v>

of variable geometry for integration, that is, an integration at multispeed.

### 5.2.2 Non-reciprocal trade agreements

Non-reciprocal trade agreements result more from historical and (geo)political motivations in the specific case of Africa. The first trade preferences date to the colonial period, when tropical products coming from colonies had privileged access to colonised markets, allowing them to secure their supplies. With the advent of decolonisation, the fourth part of the Rome Treaty (1957) established that the European Economic Community (EEC) granted free access to markets of former colonisers for exports of overseas countries and territories. The independence of ex-colonies led to new international trade treaties, notably the Yaoundé (1963), Lomé (1975), and Cotonou (2000) agreements between EU and ACP countries<sup>12</sup>. In parallel, the United Nations Conference on Trade and Development (UNCTAD)<sup>13</sup> implemented the generalized system of preferences (GSP) at the end of the 1960s, and it has opened the door to a plethora of RTAs of this kind for each of the advanced economies but also with specific treatments for least-developed countries (LDCs). For example, in the case of the EU<sup>14</sup>, in which their GSP (1971) is broken down into three trade groups. First is the “classic” GSP for all developing economies around the world even if the graduation mechanism stops the preferential advantages for emerging

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<sup>12</sup>Since the 2000s, EU and ACP countries have launched the negotiations for the establishment of the Economic Partnership Agreements (EPA) for each developing regions.

<sup>13</sup>The Resolution 21 of the UNCTAD II Conference in New-Delhi (India) in 1968: “The objectives of the generalized, non-reciprocal, non-discriminatory system of preferences in favour of the developing countries, including special measures in favor of the least advanced among the developing countries, should be to increase their export earning, to promote their industrialization and to accelerate their rates of economic growth”.

<sup>14</sup>The preferential US trade system also comprises the African Growth and Opportunity Act (AGOA) since 2000. African countries have duty-free access to the US market, which is non-reciprocal, and the list of beneficiaries is renewed annually according to political and economic criteria.

countries. Second, the “GSP+” extends these preferences for developing countries that ratify conventions on human rights (which drastically reduces the number of beneficiaries). Third, the device “Everything But Arms” (EBA) is the most advantageous, with a duty-free access for 99% of tariff lines exclusively concerning LDCs. Furthermore, emerging countries (India, China, Taiwan, Republic of Korea)<sup>15</sup> have recently granted duty-free treatment for LDCs to sustain their economic expansion in the world economy and essentially in Southern countries. This conversion for RTAs is only valid with developing countries, since developed countries are more reluctant to belong to reciprocal trade agreements.

## 5.3 Review of the literature

### 5.3.1 Heterogeneity of RTAs according to the kind

#### Reciprocal trade agreements

“The effect of a FTA is likely to differ depending upon the agreement” (Baier and Bergstrand, 2007). We now investigate the idea, recently developed by the specialised literature, that the degree of depth of preferential trade liberalisation varies the trade effects. The first studies report the effects of RTAs according to the typology established by Balassa (1961). Magee (2008) concludes that PTAs have a smaller effect on trade flows between members, whereas CUs have a higher and long-lasting impact, followed by FTAs, which are more effective especially in the short-run. Vicard (2009) finds that whatever the kind of RTAs, they are all significant with a positive and robust effect on trade. For instance, common market increases bilateral trade flows by 30%, for CUs and FTAs by 34%, and by 18% for PTAs, that is, a

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<sup>15</sup><http://ptadb.wto.org/ptaList.aspx>

trade-promoting effect for each RTA. Roy (2010) finds that FTAs increase by 17% bilateral trade between members on average against 77% for CUs, and these results are confirmed over time. For instance, five years after their entry into force, trade within FTAs increased 25%, and for CUs 90%, versus 26% and 110%, respectively, after 10 years. De Sousa (2012) estimated the impact of CUs on trade over a long period (1948-2009), emphasising the weakening of CUs where the choice of the estimator is decisive. Indeed, results suggest a downward trend of the effect of CUs on trade. In 1948, trade within a CU was eight times higher than that of countries having another currency, and it became negative in the 1990s, with a slight increase at the end of the 1990s. Kohl and Trojanowska (2015) show that the more RTAs are deeper (CM, CU), the more their impact on trade increases, whereas, non-reciprocal trade agreements have a very small positive effect on trade.

### **Non-reciprocal trade agreements**

Ozden and Reinhardt (2005) demonstrate that GSP delays the trade liberalisation of beneficiary countries toward donors where a reciprocal liberalisation through GATT-WTO would be a better option. In other words, GSP encourages the increase of trade protection for developing countries (an average increase of tariffs to 3.83%) belonging to this type of RTA. Herz and Wagner (2011) point out three main findings about GSP over the period 1953 to 2006. First, GSP has a positive and significant effect for exports of beneficiaries, but only in short-term. Whereas in the long-term, the effect is reversed, with trade preferences that accentuate trade concentration of developing countries, discouraging deeper trade liberalisation. Second, the same effects appear for GSP granting countries. Third, this non-reciprocal trade agreement does not allow a significant enhancement of their economic development because it increase

their unwillingness to pass to reciprocal trade agreements<sup>16</sup>. Gil-Pareja et al. (2014) find strong and robust evidence of positive effects of the majority of non-reciprocal trade agreements for exports of developing countries. Furthermore, eight years after their implementation, these non-reciprocal RTAs increase bilateral trade by 88%. From individual estimates of these trade agreements, results show that the main GSPs, AGOA, EBA, and ACP-EU increase on average exports of beneficiaries.

### 5.3.2 Heterogeneity of RTAs according to the nature of trading partners

#### South-South RTAs vs North-South RTAs

The economic literature is also mixed about the effectiveness of South-South trade agreements on trade, unlike for North-South trade agreements where the choice of the trading partners matters in RTAs. Venables (2003) argues that having RTAs between developing countries is ineffective in terms of economic convergence caused by the lack of complementarities and the similarity of factorial endowments. Whereas, trade agreements with advanced economies would be more beneficial to developing countries. Medvedev (2010) also explores the existence of evidence of differences between North-South, South-South and North-North trade agreements. The findings show that RTAs between developed economies have no significant effect on bilateral trade, whereas RTAs between developing countries have a higher effect than do North-South trade agreements, 163% and 40%, respectively. He explains that the trade liberalisation in a South-South trade agreement leads to greater benefits due to the initial high level of tariffs compared with Northern countries. Vicard (2011) conversely finds that whatever the economic level of trading partners (developing

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<sup>16</sup>The EPA's negotiations provide a perfect illustration of this situation.

and developed countries) in RTAs, they have the same effect on trade. Behar and Cirera-i-Crivillé (2013) provide the evidence of differences between North-South and South-South trade agreements on bilateral trade from robust estimates. FTAs between developing countries have the highest impact on trade compared with FTAs between developed and developing countries, with 107% and 53%, respectively. They justify these results by the improvement in competition framework that allows the strengthening of competition first in regional markets then worldwide. Cheong et al. (2015) sustain these findings, where North-South trade agreements have the smallest effect on trade (26.5%-24.7%) and South-South trade agreements lead to an additional trade of 71.8% to 72.6% versus 47% to 51.7% for North-North RTAs.

### **The case of SSA's RTAs**

The very low level of intra-african trade compared with the other regions whatever their level of development caught the attention of researchers, despite the multiple RTAs in place. Foroutan and Pritchett (1993) find that very few RTAs in Africa have a significant effect on intra-trade which can explain their failure to enhance trade between them essentially because of the slow implementation for internal reasons. Gunning (2001) argues that South-South RTAs in Africa are inefficient to promote trade between members where the poorer are the main losers because of the wealth concentration in the richer countries, enabling them to take advantage of scale effects.

According to Carrère (2004), African RTAs lead to a trade-promoting effect on intra-African trade, where CUs provide a greater trade creation effect than PTAs with an evidence of trade diversion. More precisely, she finds, as do Lomé and Cotonou, that non-reciprocal trade agreements have doubled bilateral trade, and RTAs such as WAEMU, SADC, ECOWAS, and EMCCA have contributed on average to increased

trade between members even if a trade diversion appears during the first years of their entry into force. Coulibaly and Fontagné (2006) underline the evidence that the geographical environment, such as location and, the state of infrastructure, are strong hindrances to intra-trade for WAEMU. Masson (2007) studied the opportunities of the establishment of CU in Africa in order to offset the narrow markets. He pointed out that some conditions<sup>17</sup> must be present to optimise the gains of CU. However, he concluded that a single African currency union is less advantageous than deepen the existing RTAs within heterogeneous countries. Coulibaly (2009) find that five years before and ten years after the implementation of ECOWAS, bilateral trade increased, with a decreasing trend following that period. For SADC, an anticipation effect appeared five years before the official entry into force, where this RTA improved trade between members<sup>18</sup>. Carrère (2013) analysed the impact of WAEMU and EMCCA in terms of trade performance over the period 1995 to 2010. On one hand, a trade creation appears for industrial products within WAEMU against a trade diversion for imports, whereas EMCCA does not significantly enhance intra-bloc trade. On the other hand, members of these RTAs having a concentrated trade pattern and are more affected by a trade diversion, unlike more diversified countries. MacPhee and Sattayanuwat (2014) show that EAC, ECOWAS, and SADC allowed an increase in trade flows, on average, but a decrease with the ROW, unlike EMCCA and ECOWAS.

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<sup>17</sup>An initial high level of trade between partners and an independent central bank.

<sup>18</sup>Even if the effect became very weakly negative over time for intra and extra-trade.

### 5.3.3 Heterogeneity of RTAs according to the form : overlapping effect

The multi-membership is one of the main characteristics of RTA proliferation that, according to some economists, could undermine the initial gains of RTAs with the increase in trade costs by the overlapping of rules of origins<sup>19</sup> (Bhagwati *et al.*, 1998 ; Park and Park, 2011). Egger and Larch (2008), and Chen and Joshi (2010) indicate that a pre-existing RTA is an important determinant that increases the probability of belonging to another RTA, empirically assessing the domino effect of RTAs. In other words, “The domino theory posits that signing one FTA induces outside nations to sign new FTAs that they previously shunned since the trade diversion effect of the first FTA creates new political economy forces in excluded nations”<sup>20</sup>. Lee *et al.* (2008) find that trade creation is higher for original members of RTAs than for new members, and bilateral trade within another RTA increases more than within a pre-existing RTA. Concerning the effect of overlapping, when members participate in another RTA, there is higher additional trade within a single RTA than in a new RTA. In other words, the multi-membership in several RTAs is less beneficial than to belong to only one RTA. Hur *et al.* (2010) estimate that the overlapping of FTAs leads to increased growth rate of trade for members to 5.57% due to the hub-and-spoke<sup>21</sup> structure, and this is essentially for hub countries. Indeed, the hub countries have the capacity to trade more in several FTAs by remaining the hub. Cheong *et al.* (2015) underline the significant impact of pre-existing PTAs on trade effects

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<sup>19</sup>According to the WTO, rules of origin are the criteria needed to determine the national source of a product.

<sup>20</sup><http://www.voxeu.org/article/contagious-ftas-new-evidence-domino-theory-regionalism>

<sup>21</sup>A hub is defined as a country that has at least two spokes belonging to the same RTA, and that also participate in another RTA between spoke countries without the hub (Hur *et al.*, 2010).

for countries that belong to another PTA. More precisely, they find that the trade creation between member countries is always positive, but weaker (dilution effect)<sup>22</sup> in this situation, whereas the trade diversion is mitigated (shielding effect)<sup>23</sup>. Sorgho (2016) show that “an additional RTA concluded by one of both countries decreased trade by 12.1%, all else being equal”. Moreover, participation in another RTA with the US or EU leads to a trade-diversion effect (on average 3%), whereas the “spaghetti bowl” phenomenon is not confirmed for North-North, South-South and North-South preferential trade.

#### 5.3.4 Heterogeneity of RTAs over time: phase-in effect

Baier and Bergstrand (2007), and Baier et al. (2014) emphasise that RTAs have a delayed impact on bilateral trade due to the progressive implementation of tariff liberalisation over 5 to 10 years period after their entry into force. Indeed, they argue, as do Bergstrand et al. (2015), that trade liberalisation leads to a terms-of-trade modification with a lagged effect on trade of countries. They then found that trade increased by 114% 10 years after the entry into force of a RTA. More precisely, non-reciprocal trade agreements, FTAs, CUs increase members’ bilateral trade flows by 49%, 60%, 99%, respectively, after 10 years.

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<sup>22</sup>A pre-existing PTA with an outside country diminishes the trade growth with a member country of a new PTA. In other words, countries continue to trade with trading partners in a former PTA, but to a lesser extent because of the new adhesion to a PTA.

<sup>23</sup>Members of an initial PTA have a higher level of trade compared with members of a new PTA due to the trade-promoting effect reducing the trade diversion.

## 5.4 Empirical specification: structural gravity model

### 5.4.1 Data

We use a worldwide database<sup>24</sup> covering the period 1948 to 2012 with more than 1.3 million observations built by Head et al. (2010). This database includes the traditional variables<sup>25</sup> of a gravity model like GDP, GDP per capita, geographical distance, shared language, contiguity, former colonisers and colonies. The value of bilateral exports ( $X_{ijt}$ ) is in million U.S dollars constructed from DOTS (IMF) and complemented from COMTRADE. The data about RTAs come from the WTO databases<sup>26</sup> allowing us to break these variables down according to their nature (Table 10).

### 5.4.2 Estimation issues and empirical model

The gravity model is a key tool specifically used in the international trade field, and it provide robust estimates by taking into account some theoretically consistent econometrics issues. The first two consist to capture the multilateral resistance developed by Anderson and van Wincoop (2003) and the endogeneity of trade policy through RTAs (Baier and Bergstrand, 2007 ; Egger et al., 2011). On one hand, multilateral resistance means that trade between trading partners is also influenced by trade costs across the other exporters and importers (relative price effects). On the other hand, RTA membership is treated as an endogenous factor of bilateral trade where economic and political conditions encourage the implementation of RTAs.

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<sup>24</sup>See the website of Keith Head: <http://strategy.sauder.ubc.ca/head/sup/>

<sup>25</sup>For more details about the data origin see the appendix of Head et al. (2010): <http://strategy.sauder.ubc.ca/head/Papers/erosion.pdf>.

<sup>26</sup><http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx> ; <http://ptadb.wto.org/default.aspx> ; [https://www.wto.org/english/tratop\\_e/tpr\\_e/tpr\\_e.htm](https://www.wto.org/english/tratop_e/tpr_e/tpr_e.htm)

In order to avoid these biases, a consensus appears in the literature to use fixed effects (country-year and country-pair) to account for where we complete with PPML (Santos Silva and Tenreyro, 2006 ; Santos Silva and Tenreyro, 2011 ; Fally, 2015) to correct selection/omitted bias with the presence of zero trade flows in our sample but also the heteroscedasticity issue.

Equation 1 shows the economic intuition derived to Newton law's with the positive and proportional effect of economic size of trading partners ( $Y_i$ ,  $E_j$ ) on bilateral trade ( $X_{ij}$ ), the reverse effect of trade costs ( $\tau_{ij}$ ) such as geographical distance and trade costs across the other export and import markets through relative price effects ( $P_i$ ,  $P_j$ ). Indeed, based on Armington hypotheses about specialisation, identical constant elasticity substitution ( $\sigma$ ) and the theoretical-consistent background developed by Anderson and van Wincoop (2003), we resume this theoretical gravity equation:

$$X_{ij} = \left( \frac{Y_i E_j}{Y_w} \right) \left( \frac{\tau_{ij}}{P_i P_j} \right)^{1-\sigma} \quad (5.1)$$

Accordingly, our empirical model is as follows (Equation 2) by taking into account the theoretical contribution of Anderson and van Wincoop (2003) concerning multilateral resistance terms and the approach developed by Baier and Bergstrand (2007) for the endogeneity of RTAs through country-pair fixed effects<sup>27</sup> and time dummies:

$$\ln X_{ijt} = \beta_0 + \beta_1 \ln \alpha_{i(j)t} + \beta_2 RTA_{ijt} + \eta_{ij} + \mu_t + \epsilon_{ijt} \quad (5.2)$$

where  $X_{ijt}$  is country  $i$  exports to  $j$  at year  $t$ .  $\alpha_{i(j)t}$  regroups time-varying monadic

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<sup>27</sup>Country-years fixed effects is a method "computationally burdensome and even impossible to apply in the case of large dataset that include many countries and years. [...] We therefore adopt another solution that consists of capturing these terms (multilateral resistance) with bilateral fixed effects." (Lavallée and Lochard, 2015)

variables like GDP and population where  $\eta_{ij}$  captures unobserved time-(in)variant bilateral factors with country-pair fixed effects and time dummies ( $\mu_t$ ) as advised by Baldwin and Taglioni (2006) and Head and Mayer (2014).

In order to be consistent with the recent econometric approaches, we decide to estimate the effects of six SSA's RTAs (SADC, COMESA, ECOWAS, WAEMU, EMCCA, EAC) with one binary variable for each trade agreements and not lump them in a single variable. To simplify the writing of our variable of interest, we use  $RTA_{ijt}$  which is broken down for each RTAs studied to account the heterogeneity effect of SSA's RTAs. The first approach is to estimate the traditional trade effects of RTAs through trade creation and diversion from our variable of interest. Dummy variables for the net effects of trade creation of RTAs ( $RTA\_TC_{ijt}$ ) equal 1 depending on whether trading partners belong to the same RTA since its year of entry into force. The trade diversion variable ( $RTA\_TD_{ijt}$ ) takes 1 if one of the trading partner participates in this RTA and the other not, 0 otherwise. There is a net trade creation if this trade creation is higher than the trade diversion. The expected signs on trade flows are positive for the former due to the reduction or elimination of trade barriers and negative for the latter because of a more efficient price-competitiveness of non-members. We suppose here that the trade diversion of RTAs differs across outside trading partners, and we break down these latter for OECD and China because they are the main non-member trading partners of SSA. Second, we specify RTA dummies from the Balassa typology (PTA, FTA, CU) but also through non-reciprocal trade agreements (GSPs). For instance, a FTA dummy variable takes 1 for countries that are members of the same FTA since its year of entry into force, 0 otherwise. We argue here that the greater that trade is integrated, the greater is positive impact on trade flows due to the strengthening of trade liberalisation, allowing a reduction in trade costs. Third, we attempt to assess the effects of multi-

memberships of SSA's RTAs on trade flows ("spaghetti bowl" effect) for member countries. This dummy variable equals 1 if  $i$  and  $j$  belong to the same RTA since its creation and  $i$  or  $j$  join another RTA, 0 otherwise (Lee et al., 2008). We investigate four cases of overlapping RTAs: COMESA-EAC, SADC-COMESA, SADC-EAC, and ECOWAS-WAEMU. The expected sign is negative because the multi-memberships could increase transaction costs and slow down the implementation of the trade liberalisation schedule in other RTAs.

In addition to these specifications, we use a first-differenced panel (Equation 3) to capture the delayed and anticipatory effects of RTAs over time (Baier and Bergstrand, 2007 ; Baier et al., 2014) decomposed according to type (PTA, FTA, CU). More precisely, first-differencing (here fifth-differences<sup>28</sup>) is an alternative to fixed effects estimations that removes dyadic variables and allows better estimates when  $T$  is very large by controlling endogeneity. We therefore include 5- and 10-year lags but also 5-year leads for each RTA variables to investigate the delayed (short and long-term) and anticipation effects of RTAs due to their gradual implementation over time for members' trade. About the anticipatory effect of RTAs (Winters, 1984; Freund and McLaren, 1999; Magee, 2008), on the one hand, an announcement effect can promote trade flows between members over a time period prior the implementation of RTA. On the other hand, a trade-deteriorating effect can also appear due to the lack of credibility of policy makers to implement a RTA for economic partners leading to change their strategy (Kreinin and Plummer, 2002). To keep robust and consistent estimates with the theoretical background previously described regarding multilateral resistance (Anderson and van Wincoop, 2003 ; Head and Mayer, 2014),

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<sup>28</sup> $\Delta_5$  because first-differencing trade flows vary very slowly over time and as argued by Baier et al. (2014) it is preferable to use data differenced over a longer period than annually where "dependent and independent variables cannot fully adjust in a single year's time" (Cheng and Wall, 2005).

we incorporate country-year, country-pair fixed effects and time dummies ( $\delta_{it}$ ,  $\psi_{jt}$ ,  $\eta_{ij}$ ,  $\mu_t$ , respectively). Indeed, the former “account for endogenous prices and unobserved time-varying exporter and importer multilateral heterogeneity” and the latter “account for unobserved time-invariant bilateral effects, including pair-specific initial border effect levels” (Bergstrand et al., 2015).

$$\Delta_5 \ln X_{ijt} = \beta_0 + \beta_1 (\Delta_5 RTA_{ijt}) + \delta_{it} + \psi_{jt} + \eta_{ij} + \epsilon_{ijt} + \mu_t \quad (5.3)$$

## 5.5 Results

The empirical results in Tables 1-8 show the average effects of RTAs on trade flows over the period since the entry into force of these RTAs. We particularly focus our analysis on PPML-fixed effects specifications.

### 5.5.1 Trade creation and diversion effects without disaggregated RTAs

#### Overall effects

Without disaggregated RTAs (Table 1), we find that RTAs in SSA increase trade between members countries where the trade creation is higher than the trade diversion in several cases. Except for EMCCA, intra-bloc trade increases for SADC, ECOWAS, COMESA and WAEMU. For instance, bilateral trade between members increased by 158% ( $[\exp(0.95)-1] \times 100$ ) for SADC, 78% for ECOWAS, 36% for COMESA and 28% for WAEMU. Evidence of an improvement in bilateral trade flows into these RTAs appear by focusing on South-South preferential trade agreements over a long period. The acceleration of the implementation of RTAs during the past few decades

due to an increased willingness of African leaders coupled with a strong investment of regional institutions such as NEPAD and, African Development Bank (ABD) into infrastructures to overcome these hindrances seems to have better economic spillover and facilitate trade.

### **Decomposition of trade diversion effect: OECD *vs* China**

In order to better capture the trade diversion effect, we decide to break down this variable into two destinations: OECD (Table 2) and China (Table 3). The idea is to see whether or not these RTAs reduce trade with non-member countries. The results show that the RTA members' trade (WAEMU and EAC) with OECD countries decreases on average (-35% and -45%, respectively), whereas SADC and EMCCA do not divert trade with China (8.9 and 4.3 times higher, respectively) unlike for ECOWAS (-64%). Results clearly show that OECD economies are more affected by trade diversion compared with China, probably due to a trade reorientation committed by African countries to emerging economies. In other words, it would seem that these SSA's RTAs lead to a trade-deteriorating effect with some developed countries, like for OECD economies, at the benefit of an increase in bilateral trade flows with emerging countries. We suppose that the complementary trade pattern and the implementation of multilateral trade liberalisation for developing economies can justify these findings.

### 5.5.2 Trade creation and diversion effects according to RTA type

#### Overall effects

More and more papers in the economic literature are unanimously saying that the effects of RTAs on trade flows are heterogeneous according to their type (PTA, FTA, CU) and their geographical location. A decomposition of these variables is required to assess their impact. Table 4 provides consistent estimates showing that FTAs (SADC, ECOWAS) have greater positive effect on intra-bloc trade than do CUs (EAC). For instance, intra-SADC trade on average increases to 87% versus 29% for EAC, even if the latter diverts more trade with non-members than between members. These findings clearly show that without taking into account the forms of RTAs, results seem to be overestimated when we compare them with the findings in Table 1.

#### Decomposition of trade diversion effect: OECD *vs* China

Table 5 presents the trade diversion effect break-up for China. RTAs in SSA on average increase trade to a greater extent with non-members (China) than with members of COMESA, EMCCA, ECOWAS and SADC (respectively +385%, +143%, +141% and +95%). All trade diversion coefficients (except for WAEMU and EAC) are higher than trade creation, and they are significantly positive. In other words, the members countries of these RTAs export more to China compared with intra-african exports. The results about OECD are more mixed (Table 6). COMESA, ECOWAS and EAC members divert trade with OECD countries (-29%, -31% and -34%, respectively), whereas for the other RTAs their coefficients are not significant.

Compared with the estimates for China, SSA's RTAs diminish trade with OECD where trade diversion coefficients are higher than trade creation. These findings underline the reverse effect of RTAs taking into account their form when OECD and China are the outside trading partners. In this specification, a trade-promoting effect essentially appears for bilateral trade between some members of SSA trade agreements and China relative to the results detailed in Table 2 and Table 3.

### **Reciprocal *vs* non-reciprocal RTAs**

Table 7 show the estimates that compare the effects of reciprocal and non-reciprocal trade agreements. These results clearly highlight the evidence of differences between these two kinds of RTAs for SSA members. In fact, the coefficients for each of the RTAs are significantly positive, trade creation sometimes exceeding trade diversion. The non-reciprocal trade agreements (here GSP) do not sustain exports of beneficiary countries to countries granting these trade preferences, except for the US. More precisely, some reciprocal RTAs analysed increase trade between members more than decrease trade with outside countries (SADC, ECOWAS) contrary to COMESA and EAC. In our case, we also find strong evidence that the New-Zealander GSP diminishes trade with SSA countries, whereas US GSP increases bilateral trade over the studied period. These results show once again the ambiguous effect of non-reciprocal trade agreements on trade compared with reciprocal RTAs between developing countries due to drawbacks of unilateral preferences for beneficiary countries such as trade concentration and, weak preferential coverage for products and tariffs.

### 5.5.3 Overlapping effect

Findings in Table 8 show the overlapping effect in four situations: (i) SADC members that also belong to EAC, (ii) SADC members that also belong to COMESA, (iii) COMESA members that also involve EAC and, (iv) ECOWAS members that also involve WAEMU. None of these situations are significant. Even if our findings do not provide empirical evidence of the “spaghetti bowl” phenomenon of RTAs, African authorities have recently launched a tripartite FTA (in June 2015) by merging COMESA-SADC-EAC to resolve this overlap.

### 5.5.4 Accounting for “phased-in” RTAs: anticipatory, short and long-run effects

Looking at Table 9, we see that the majority of SSA’s RTAs studied in this chapter have no impact in the short-term (5-year lags) and long-term (10-year lags), and this also can be said for anticipatory effects, except for SADC and EAC. We can justify the trade-deteriorating effect of SADC (-42%) and EAC (-47%) 5 years after their formation due to the delays of implementation and the lack of credibility of African policy makers. These latter can produce an increase in transaction costs and uncertainty for bilateral trade. Furthermore, the successive delays<sup>29</sup> in their regional integration program lead to shift in time the expected trade gains. For instance, the implementation of FTA for SADC members lasted 7 years, where 85% of intra-trade was duty-free<sup>30</sup>, whereas, the establishment of a CU had been delayed to 2010, and then to 2013. Regarding COMESA, a transitional period of ten years beginning in 2009 in effect: “there shall be progressively established in the course of

<sup>29</sup><http://www.uneca.org/publications/serie/assessing-regional-integration-in-africa>

<sup>30</sup><http://www.sadc.int/about-sadc/integration-milestones/free-trade-area/>

a transitional period of ten years from the entry into force of the Treaty, a Customs Union among the Member States”<sup>31</sup>. Then, the political instability and unwillingness in African regions and the gaps of the customs administrations in implementing trade commitments can explain these findings. Nevertheless results suggest that only members of EAC<sup>32</sup> anticipated the implementation of this RTA (5 years before) by increasing trade by 122% (announcement effect).

## 5.6 Conclusion

The expansion of South-South trade agreements is one of the main characteristics of the “new” geography of international trade over the past few decades. Using a structural gravity model over the period 1948-2012 with several theory-consistent and robust specifications, this chapter attempts to demonstrate the heterogeneous effects of RTAs on trade flows applied to SSA economies, particularly through the nature of non-members countries and the types of RTAs.

First, without disaggregating these SSA’s RTAs, results suggest that they globally increase, on average, intra-bloc trade where trade creation effect is higher than trade diversion. Second, we examine whether trade diversion of RTAs differs according to outside trading partners, where we focus on specific non-members countries like OECD economies and China. These findings are consistent with the trade re-orientation of SSA to emerging countries during the past few decades where SSA RTAs do not divert trade with China, but significantly increase it, unlike OECD countries. Third, we also remark that without taking into account the individual

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<sup>31</sup>[http://programmes.comesa.int/index.php?option=com\\_content&view=article&id=90&Itemid=142](http://programmes.comesa.int/index.php?option=com_content&view=article&id=90&Itemid=142)

<sup>32</sup>Note that EAC replaced a former CU between Kenya, Tanzania and Uganda in 2000, which collapsed in 1977, despite several failed attempts to relaunch this RTA. Therefore, there were approximately twenty years without regional trade preferences between these economies.

forms of RTAs, results seem to be overestimated. Indeed, SSA FTAs and CUs have a significant positive effect on trade flows of members, whereas FTAs have a greater impact on exports of member countries than do CUs; PTAs were found to be ineffective in trade flows. Fourth, differences between reciprocal and non-reciprocal trade agreements are confirmed in this chapter, where the former promote trade creation and the latter decrease trade for beneficiary countries for New-Zealander GSP, except for US GSP. Fifth, we found no empirical evidence of the “spaghetti bowl” effect of RTAs in four situations of multimembership: COMESA-EAC, SADC-COMESA, SADC-EAC, and ECOWAS-WAEMU. Finally, results indicate that the majority of SSA’s RTAs have no impact in the short- and long-term, except for SADC and, EAC. These latter have a trade-deteriorating effect 5 years after their entry into force, essentially due to the successive delays in their application. Only one, EAC, anticipated the formation of RTA, 5 years before its creation, with an increase in bilateral trade flows, the others are not significant.

We clearly find evidence that these South-South trade agreements promote rather than hinder trade between members and non-members (specifically with China) according to the specifications used. Regional and multilateral projects, such as the NEPAD, the African Development Bank, and trade facilitation<sup>33</sup> with the implementation of the “Bali package”<sup>34</sup> could improve their regional trade integration, as well as promoting in world trade. In the specific context of African economies, the security and political dimensions (Mayer and Thoenig, 2016) need to be taken into account to better understand the effectiveness of these RTAs on trade.

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<sup>33</sup><http://www.ictsd.org/bridges-news/bridges-africa/news/wto-talks-trade-facilitation-in-support-of-africa%E2%80%99s-regional>

<sup>34</sup>Adopted in 2013 by the WTO members.

Table 5.1: Trade creation and diversion (overall effects)

	OLS	MFE	DFE	PPML
<i>ln GDP<sub>it</sub></i>	0.74 <sup>a</sup> (0.006)		0.76 <sup>a</sup> (0.01)	0.81 <sup>a</sup> (0.03)
<i>ln GDP<sub>jt</sub></i>	0.65 <sup>a</sup> (0.006)		0.65 <sup>a</sup> (0.01)	0.72 <sup>a</sup> (0.02)
<i>ln Population<sub>it</sub></i>	0.2 <sup>a</sup> (0.008)		-0.39 <sup>a</sup> (0.04)	-0.19 <sup>b</sup> (0.08)
<i>ln Population<sub>jt</sub></i>	0.15 <sup>a</sup> (0.008)		0.37 <sup>a</sup> (0.03)	-0.06 (0.07)
<i>ln Distance<sub>ij</sub></i>	-1.13 <sup>a</sup> (0.01)	-1.35 (0.01)		
<i>Contiguity<sub>ij</sub></i>	0.58 <sup>a</sup> (0.06)	0.48 <sup>a</sup> (0.07)		
<i>Common language<sub>ij</sub></i>	0.77 <sup>a</sup> (0.03)	0.77 <sup>a</sup> (0.03)		
<b>Trade creation</b>				
<i>SADC-TC<sub>ijt</sub></i>	-0.05 (0.19)	0.19 (0.34)	0.63 <sup>a</sup> (0.14)	0.95 <sup>a</sup> (0.15)
<i>COMESA-TC<sub>ijt</sub></i>	-1.27 <sup>a</sup> (0.17)	0.88 <sup>a</sup> (0.26)	0.28 <sup>a</sup> (0.1)	0.31 <sup>a</sup> (0.10)
<i>ECOWAS-TC<sub>ijt</sub></i>	-0.73 <sup>a</sup> (0.14)	0.20 (0.59)	0.12 (0.14)	0.58 <sup>a</sup> (0.21)
<i>WAEMU-TC<sub>ijt</sub></i>	0.08 (0.29)	0.83 (0.99)	-0.03 (0.21)	0.25 <sup>b</sup> (0.12)
<i>EMCCA-TC<sub>ijt</sub></i>	-2.26 <sup>a</sup> (0.43)	0.84 <sup>c</sup> (0.43)	-1.18 <sup>a</sup> (0.38)	-0.38 (0.35)
<i>EAC-TC<sub>ijt</sub></i>	0.26 (0.4)	-1.66 <sup>a</sup> (0.37)	0.72 <sup>a</sup> (0.19)	0.13 (0.19)
<b>Trade diversion</b>				
<i>SADC-TD<sub>ijt</sub></i>	-0.63 <sup>a</sup> (0.06)	-1.07 <sup>a</sup> (0.35)	-0.05 (0.06)	0.16 <sup>c</sup> (0.09)
<i>COMESA-TD<sub>ijt</sub></i>	-1.47 <sup>a</sup> (0.05)	0.26 (0.25)	-0.27 <sup>a</sup> (0.04)	-0.16 (0.1)
<i>ECOWAS-TD<sub>ijt</sub></i>	-1.24 <sup>a</sup> (0.07)	-0.56 (0.59)	-0.23 <sup>a</sup> (0.06)	-0.03 (0.22)
<i>WAEMU-TD<sub>ijt</sub></i>	-0.75 <sup>a</sup> (0.09)	-0.60 (1.0005)	-0.22 <sup>a</sup> (0.07)	-0.17 <sup>c</sup> (0.09)
<i>EMCCA-TD<sub>ijt</sub></i>	-2.21 <sup>a</sup> (0.11)	0.84 <sup>c</sup> (0.43)	-0.6 <sup>a</sup> (0.1)	-0.12 (0.14)
<i>EAC-TD<sub>ijt</sub></i>	-1.04 <sup>a</sup> (0.09)	-3.88 <sup>a</sup> (0.29)	-0.18 <sup>b</sup> (0.07)	-0.44 <sup>a</sup> (0.1)
<i>Constant</i>	-23.14 <sup>a</sup> (0.22)	12.34 <sup>a</sup> (0.13)	-32.65 <sup>a</sup> (0.49)	
Observations	731622	818071	731623	1073038
Country-year fixed effects	No	Yes	No	No
Country-pair fixed effects	No	No	Yes	Yes
Time dummies	No	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.53	0.70	0.83	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels. MFE and DFE respectively mean monadic fixed effects and dyadic fixed effects.

Table 5.2: Decomposition of trade diversion (OECD)

	MFE	DFE	PPML
<i>ln GDP<sub>it</sub></i>		0.76 <sup>a</sup> (0.01)	0.81 <sup>a</sup> (0.03)
<i>ln GDP<sub>jt</sub></i>		0.66 <sup>a</sup> (0.01)	0.72 <sup>a</sup> (0.02)
<i>ln Population<sub>it</sub></i>		-0.41 <sup>a</sup> (0.04)	-0.18 <sup>b</sup> (0.08)
<i>ln Population<sub>jt</sub></i>		0.32 <sup>a</sup> (0.03)	-0.07 (0.07)
<i>ln Distance<sub>ij</sub></i>	-1.36 <sup>a</sup> (0.01)		
<i>Contiguity<sub>ij</sub></i>	0.48 <sup>a</sup> (0.07)		
<i>Common language<sub>ij</sub></i>	0.77 <sup>a</sup> (0.03)		
<b>Trade creation</b>			
<i>SADC_TC<sub>ijt</sub></i>	1.44 <sup>a</sup> (0.17)	0.6 <sup>a</sup> (0.14)	0.93 <sup>a</sup> (0.15)
<i>COMESA_TC<sub>ijt</sub></i>	0.80 <sup>a</sup> (0.15)	0.29 <sup>a</sup> (0.1)	0.28 <sup>b</sup> (0.1)
<i>ECOWAS_TC<sub>ijt</sub></i>	0.84 <sup>a</sup> (0.15)	0.12 (0.14)	0.57 <sup>a</sup> (0.21)
<i>WAEMU_TC<sub>ijt</sub></i>	1.10 <sup>a</sup> (0.27)	-0.001 (0.21)	0.24 <sup>c</sup> (0.12)
<i>EMCCA_TC<sub>ijt</sub></i>	0.97 <sup>b</sup> (0.43)	-1.15 <sup>a</sup> (0.38)	-0.39 (0.35)
<i>EAC_TC<sub>ijt</sub></i>	2.15 <sup>a</sup> (0.30)	0.74 <sup>a</sup> (0.23)	0.12 (0.19)
<b>Trade diversion</b>			
<i>SADC_TD_OECD<sub>ijt</sub></i>	0.62 <sup>a</sup> (0.10)	0.09 (0.08)	0.002 (0.07)
<i>COMESA_TD_OECD<sub>ijt</sub></i>	0.28 <sup>a</sup> (0.08)	-0.40 <sup>a</sup> (0.06)	-0.24 (0.15)
<i>ECOWAS_TD_OECD<sub>ijt</sub></i>	0.39 <sup>a</sup> (0.11)	-0.18 <sup>b</sup> (0.08)	-0.11 (0.26)
<i>WAEMU_TD_OECD<sub>ijt</sub></i>	-1.04 <sup>a</sup> (0.15)	-0.76 <sup>a</sup> (0.1)	-0.43 <sup>a</sup> (0.1)
<i>EMCCA_TD_OECD<sub>ijt</sub></i>	0.41 <sup>b</sup> (0.19)	-0.88 <sup>a</sup> (0.13)	-0.24 (0.16)
<i>EAC_TD_OECD<sub>ijt</sub></i>	0.02 (0.15)	-0.55 <sup>a</sup> (0.1)	-0.58 <sup>a</sup> (0.14)
<i>Constant</i>	12.25 <sup>a</sup> (0.13)	-32.73 (0.49)	
Observations	818071	731622	1073038
Country-year fixed effects	Yes	No	No
Country-pair fixed effects	No	Yes	Yes
Time dummies	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.70	0.83	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 5.3: Decomposition of trade diversion (China)

	MFE	DFE	PPML
<i>ln GDP<sub>it</sub></i>		0.78 <sup>a</sup> (0.01)	0.81 <sup>a</sup> (0.03)
<i>ln GDP<sub>jt</sub></i>		0.65 <sup>a</sup> (0.01)	0.72 <sup>a</sup> (0.02)
<i>ln Population<sub>it</sub></i>		-0.5 <sup>a</sup> (0.04)	-0.2 <sup>b</sup> (0.08)
<i>ln Population<sub>jt</sub></i>		0.38 <sup>a</sup> (0.03)	-0.06 (0.07)
<i>ln Distance<sub>ij</sub></i>	-1.35 <sup>a</sup> (0.01)		
<i>Contiguity<sub>ij</sub></i>	0.49 <sup>a</sup> (0.07)		
<i>Common language<sub>ij</sub></i>	0.77 <sup>a</sup> (0.03)		
<b>Trade creation</b>			
<i>SADC_TC<sub>ijt</sub></i>	1.23 <sup>a</sup> (0.17)	0.63 <sup>a</sup> (0.14)	0.93 <sup>a</sup> (0.15)
<i>COMESA_TC<sub>ijt</sub></i>	0.66 <sup>a</sup> (0.14)	0.32 <sup>a</sup> (0.1)	0.28 <sup>a</sup> (0.1)
<i>ECOWAS_TC<sub>ijt</sub></i>	0.77 <sup>a</sup> (0.14)	0.14 (0.14)	0.57 <sup>a</sup> (0.21)
<i>WAEMU_TC<sub>ijt</sub></i>	1.43 <sup>a</sup> (0.27)	0.03 (0.21)	0.25 <sup>b</sup> (0.12)
<i>EMCCA_TC<sub>ijt</sub></i>	0.89 <sup>b</sup> (0.43)	-1.12 <sup>a</sup> (0.38)	-0.38 (0.35)
<i>EAC_TC<sub>ijt</sub></i>	2.11 <sup>a</sup> (0.30)	0.77 <sup>a</sup> (0.23)	0.12 (0.19)
<b>Trade diversion</b>			
<i>SADC_TD_China<sub>ijt</sub></i>	1.02 <sup>c</sup> (0.60)	0.53 (0.53)	2.19 <sup>a</sup> (0.64)
<i>COMESA_TD_China<sub>ijt</sub></i>	-0.23 (0.63)	-0.07 (0.38)	0.15 (0.19)
<i>ECOWAS_TD_China<sub>ijt</sub></i>	0.71 <sup>a</sup> (0.26)	0.42 (0.86)	-1.02 <sup>c</sup> (0.59)
<i>WAEMU_TD_China<sub>ijt</sub></i>	0.31 (0.46)	0.36 (0.36)	0.21 (0.25)
<i>EMCCA_TD_China<sub>ijt</sub></i>	3.79 <sup>a</sup> (0.59)	2.77 <sup>a</sup> (0.54)	1.47 <sup>a</sup> (0.55)
<i>EAC_TD_China<sub>ijt</sub></i>	0.21 (0.59)	0.61 <sup>c</sup> (0.33)	-0.16 (0.13)
<i>Constant</i>	12.26 <sup>a</sup> (0.13)	-32.97 (0.49)	
Observations	818071	731622	1073038
Country-year fixed effects	Yes	No	No
Country-pair fixed effects	No	Yes	Yes
Time dummies	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.70	0.83	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 5.4: Trade creation and diversion according to the RTAs types (overall effects)

	MFE	DFE	PPML
$\ln GPD_{it}$		0.76 <sup>a</sup> (0.01)	0.81 <sup>a</sup> (0.03)
$\ln GDP_{jt}$		0.65 <sup>a</sup> (0.01)	0.72 <sup>a</sup> (0.02)
$\ln Population_{it}$		-0.37 <sup>a</sup> (0.04)	-0.18 <sup>b</sup> (0.08)
$\ln Population_{jt}$		0.37 <sup>a</sup> (0.03)	-0.06 (0.07)
$\ln Distance_{ij}$	-1.35 <sup>a</sup> (0.01)		
$Contiguity_{ij}$	0.51 <sup>a</sup> (0.07)		
$Common\ language_{ij}$	0.77 <sup>a</sup> (0.03)		
<b>Trade creation</b>			
$SADC\_FTA\_TC_{ijt}$	0.006 (0.70)	0.48 <sup>a</sup> (0.14)	0.63 <sup>a</sup> (0.10)
$COMESA\_FTA\_TC_{ijt}$	-0.99 (0.65)	0.51 <sup>a</sup> (0.16)	0.19 (0.18)
$ECOWAS\_FTA\_TC_{ijt}$	0.55 (0.63)	0.32 <sup>b</sup> (0.15)	0.4 <sup>b</sup> (0.16)
$WAEMU\_CU\_TC_{ijt}$	1.07 <sup>a</sup> (0.20)	-0.32 (0.28)	-0.22 (0.20)
$EMCCA\_PTA\_TC_{ijt}$	0.80 <sup>c</sup> (0.43)	-1.02 <sup>a</sup> (0.38)	-0.39 (0.35)
$EAC\_CU\_TC_{ijt}$	2.14 <sup>a</sup> (0.35)	0.52 <sup>b</sup> (0.25)	0.26 <sup>c</sup> (0.14)
<b>Trade diversion</b>			
$SADC\_FTA\_TD_{ijt}$	-1.47 <sup>b</sup> (0.73)	-0.13 <sup>b</sup> (0.05)	0.18 <sup>b</sup> (0.08)
$COMESA\_FTA\_TD_{ijt}$	-1.83 <sup>a</sup> (0.65)	-0.09 (0.05)	-0.24 <sup>b</sup> (0.12)
$ECOWAS\_FTA\_TD_{ijt}$	-0.52 (0.60)	-0.58 <sup>a</sup> (0.08)	-0.22 (0.13)
$WAEMU\_CU\_TD_{ijt}$	-1.24 <sup>a</sup> (0.33)	0.13 (0.1)	-0.04 (0.14)
$EMCCA\_PTA\_TD_{ijt}$	-0.80 <sup>c</sup> (0.43)	-0.62 <sup>a</sup> (0.1)	-0.12 (0.14)
$EAC\_CU\_TD_{ijt}$	-2.15 <sup>a</sup> (0.35)	-0.36 <sup>a</sup> (0.07)	-0.47 <sup>a</sup> (0.11)
$Constant$	12.42 <sup>a</sup> (0.15)	-32.66 (0.49)	
Observations	818071	731622	1073038
Country-year fixed effects	Yes	No	No
Country-pair fixed effects	No	Yes	Yes
Time dummies	Yes	Yes	Yes
$R^2$	0.70	0.83	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 5.5: Decomposition of trade diversion effect (China)

	MFE	DFE	PPML
$\ln GDP_{it}$		0.78 <sup>a</sup> (0.01)	0.69 <sup>a</sup> (0.02)
$\ln GDP_{jt}$		0.65 <sup>a</sup> (0.01)	0.58 <sup>a</sup> (0.02)
$\ln Population_{it}$		-0.5 <sup>a</sup> (0.03)	-0.26 <sup>a</sup> (0.08)
$\ln Population_{jt}$		0.38 <sup>a</sup> (0.03)	-0.09 (0.08)
$\ln Distance_{ij}$	-1.35 <sup>a</sup> (0.01)		
$Contiguity_{ij}$	0.51 <sup>a</sup> (0.07)		
$Common\ language_{ij}$	0.77 <sup>a</sup> (0.03)		
<b>Trade creation</b>			
$SADC\_FTA\_TC_{ijt}$	1.47 <sup>a</sup> (0.18)	0.51 <sup>a</sup> (0.14)	0.22 <sup>a</sup> (0.09)
$COMESA\_FTA\_TC_{ijt}$	0.84 <sup>a</sup> (0.22)	0.5 <sup>b</sup> (0.16)	0.31 <sup>b</sup> (0.18)
$ECOWAS\_FTA\_TC_{ijt}$	1.08 <sup>a</sup> (0.20)	0.46 <sup>a</sup> (0.15)	0.38 <sup>a</sup> (0.14)
$WAEMU\_CU\_TC_{ijt}$	1.23 <sup>a</sup> (0.33)	-0.36 (0.27)	-0.2 (0.19)
$EMCCA\_PTA\_TC_{ijt}$	0.84 <sup>c</sup> (0.43)	-1.11 <sup>a</sup> (0.38)	-0.36 (0.38)
$EAC\_CU\_TC_{ijt}$	2.19 <sup>a</sup> (0.36)	0.57 <sup>b</sup> (0.25)	0.09 (0.16)
<b>Trade diversion</b>			
$SADC\_FTA\_TD\_China_{ijt}$	1.25 (0.78)	1.26 <sup>a</sup> (0.37)	0.67 <sup>a</sup> (0.25)
$COMESA\_FTA\_TD\_China_{ijt}$	0.52 (0.85)	1.06 <sup>a</sup> (0.4)	1.58 <sup>a</sup> (0.57)
$ECOWAS\_FTA\_TD\_China_{ijt}$	1.17 <sup>a</sup> (0.34)	1.69 <sup>a</sup> (0.52)	0.88 <sup>a</sup> (0.3)
$WAEMU\_CU\_TD\_China_{ijt}$	-0.05 (0.69)	-0.93 (0.67)	-0.31 (0.41)
$EMCCA\_PTA\_TD\_China_{ijt}$	4.08 <sup>a</sup> (0.60)	2.73 <sup>a</sup> (0.58)	0.89 <sup>a</sup> (0.38)
$EAC\_CU\_TD\_China_{ijt}$	0.22 (0.63)	0.42 (0.32)	0.16 (0.13)
$Constant$	12.34 <sup>a</sup> (0.13)	-32.89 (0.49)	
Observations	818071	731622	1073038
Country-year fixed effects	Yes	No	No
Country-pair fixed effects	No	Yes	Yes
Time dummies	Yes	Yes	Yes
$R^2$	0.70	0.83	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 5.6: Decomposition of trade diversion effect (OECD)

	MFE	DFE	PPML
<i>ln GDP<sub>it</sub></i>		0.76 <sup>a</sup> (0.01)	0.81 <sup>a</sup> (0.03)
<i>ln GDP<sub>jt</sub></i>		0.65 <sup>a</sup> (0.01)	0.72 <sup>a</sup> (0.02)
<i>ln Population<sub>it</sub></i>		-0.41 <sup>a</sup> (0.04)	-0.16 <sup>b</sup> (0.08)
<i>ln Population<sub>jt</sub></i>		0.32 <sup>a</sup> (0.03)	-0.07 (0.07)
<i>ln Distance<sub>ij</sub></i>	-1.36 <sup>a</sup> (0.01)		
<i>Contiguity<sub>ij</sub></i>	0.51 <sup>a</sup> (0.07)		
<i>Common language<sub>ij</sub></i>	0.77 <sup>a</sup> (0.03)		
<b>Trade creation</b>			
<i>SADC_FTA_TC<sub>ijt</sub></i>	1.54 <sup>a</sup> (0.18)	0.46 <sup>a</sup> (0.14)	0.61 <sup>a</sup> (0.1)
<i>COMESA_FTA_TC<sub>ijt</sub></i>	0.89 <sup>a</sup> (0.22)	0.47 <sup>a</sup> (0.16)	0.14 (0.18)
<i>ECOWAS_FTA_TC<sub>ijt</sub></i>	1.02 <sup>a</sup> (0.20)	0.41 <sup>a</sup> (0.15)	0.38 <sup>b</sup> (0.15)
<i>WAEMU_CU_TC<sub>ijt</sub></i>	1.002 <sup>a</sup> (0.33)	-0.36 (0.27)	-0.21 (0.19)
<i>EMCCA_PTA_TC<sub>ijt</sub></i>	0.88 <sup>b</sup> (0.43)	-1.16 <sup>a</sup> (0.38)	-0.39 (0.35)
<i>EAC_CU_TC<sub>ijt</sub></i>	2.21 <sup>a</sup> (0.36)	0.53 <sup>b</sup> (0.25)	0.17 (0.15)
<b>Trade diversion</b>			
<i>SADC_FTA_TD_OECD<sub>ijt</sub></i>	0.53 <sup>a</sup> (0.12)	-0.24 <sup>a</sup> (0.1)	-0.06 (0.06)
<i>COMESA_FTA_TD_OECD<sub>ijt</sub></i>	0.21 <sup>b</sup> (0.10)	-0.49 <sup>a</sup> (0.08)	-0.33 <sup>b</sup> (0.13)
<i>ECOWAS_FTA_TD_OECD<sub>ijt</sub></i>	0.29 <sup>c</sup> (0.16)	-0.9 <sup>a</sup> (0.12)	-0.37 <sup>b</sup> (0.18)
<i>WAEMU_CU_TD_OECD<sub>ijt</sub></i>	-1.10 <sup>a</sup> (0.21)	-0.09 (0.16)	-0.06 (0.2)
<i>EMCCA_PTA_TD_OECD<sub>ijt</sub></i>	0.32 (0.21)	-0.95 <sup>a</sup> (0.14)	-0.19 (0.17)
<i>EAC_CU_TD_OECD<sub>ijt</sub></i>	-0.29 <sup>c</sup> (0.16)	-0.61 <sup>a</sup> (0.11)	-0.41 <sup>a</sup> (0.11)
<i>Constant</i>	12.35 <sup>a</sup> (0.13)	-32.63 (0.49)	
Observations	818071	731622	1073038
Country-year fixed effects	Yes	No	No
Country-pair fixed effects	No	Yes	Yes
Time dummies	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.70	0.83	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 5.7: Reciprocal *vs* non-reciprocal RTAs

	MFE	DFE	PPML
<i>ln GDP<sub>it</sub></i>		0.73 <sup>a</sup> (0.01)	0.81 <sup>a</sup> (0.03)
<i>ln GDP<sub>jt</sub></i>		0.65 <sup>a</sup> (0.01)	0.72 <sup>a</sup> (0.02)
<i>ln Population<sub>it</sub></i>		-0.26 <sup>a</sup> (0.04)	-0.17 <sup>b</sup> (0.08)
<i>ln Population<sub>jt</sub></i>		0.34 <sup>a</sup> (0.03)	-0.06 (0.07)
<i>ln Distance<sub>ij</sub></i>	-1.36 <sup>a</sup> (0.01)		
<i>Contiguity<sub>ij</sub></i>	0.52 <sup>a</sup> (0.07)		
<i>Common language<sub>ij</sub></i>	0.78 <sup>a</sup> (0.03)		
<b>Trade creation</b>			
<i>SADC-FTA<sub>ijt</sub></i>	0.002 (0.70)	0.50 <sup>a</sup> (0.14)	0.65 <sup>a</sup> (0.10)
<i>COMESA-FTA<sub>ijt</sub></i>	-0.98 (0.65)	0.55 <sup>a</sup> (0.16)	0.20 (0.18)
<i>ECOWAS-FTA<sub>ijt</sub></i>	0.55 (0.63)	0.40 <sup>b</sup> (0.15)	0.43 <sup>a</sup> (0.15)
<i>WAEMU-CU<sub>ijt</sub></i>	1.15 <sup>a</sup> (0.20)	-0.31 (0.28)	-0.23 (0.20)
<i>EMCCA-PTA<sub>ijt</sub></i>	0.87 <sup>b</sup> (0.43)	-1.09 <sup>a</sup> (0.38)	-0.37 (0.36)
<i>EAC-CU<sub>ijt</sub></i>	2.20 <sup>a</sup> (0.35)	0.57 <sup>b</sup> (0.26)	0.28 <sup>c</sup> (0.14)
<i>GSP-EU<sub>ijt</sub></i>	0.56 <sup>a</sup> (0.06)	-0.40 <sup>a</sup> (0.07)	-0.23 (0.17)
<i>GSP-USA<sub>ijt</sub></i>	0.19 (0.26)	0.28 (0.26)	0.32 <sup>c</sup> (0.19)
<i>GSP-NZL<sub>ijt</sub></i>	-1.18 <sup>a</sup> (0.25)	-1.06 <sup>a</sup> (0.32)	-0.50 <sup>b</sup> (0.23)
<i>GSP-CAN<sub>ijt</sub></i>	-0.39 (0.24)	0.19 (0.3)	-0.001 (0.23)
<b>Trade diversion</b>			
<i>SADC-FTA<sub>ijt</sub></i>	-1.54 <sup>b</sup> (0.73)	-0.08 (0.05)	0.20 <sup>b</sup> (0.08)
<i>COMESA-FTA<sub>ijt</sub></i>	-1.87 <sup>a</sup> (0.65)	-0.03 (0.05)	-0.23 <sup>c</sup> (0.12)
<i>ECOWAS-FTA<sub>ijt</sub></i>	-0.61 (0.60)	-0.48 <sup>a</sup> (0.08)	-0.20 (0.12)
<i>WAEMU-CU<sub>ijt</sub></i>	-1.23 <sup>a</sup> (0.33)	0.11 (0.10)	-0.03 (0.13)
<i>EMCCA-PTA<sub>ijt</sub></i>	0.81 <sup>a</sup> (0.43)	-0.57 <sup>a</sup> (0.10)	-0.11 (0.13)
<i>EAC-CU<sub>ijt</sub></i>	2.12 <sup>a</sup> (0.35)	-0.29 <sup>a</sup> (0.07)	-0.45 <sup>a</sup> (0.15)
<i>GSP-EU<sub>ijt</sub></i>	0.30 (0.21)	-0.08 <sup>c</sup> (0.04)	0.006 (0.09)
<i>GSP-USA<sub>ijt</sub></i>	0.90 (0.60)	-0.30 <sup>a</sup> (0.04)	-0.22 <sup>b</sup> (0.11)
<i>GSP-NZL<sub>ijt</sub></i>	1.18 <sup>a</sup> (0.25)	0.06 (0.04)	0.009 (0.04)
<i>GSP-CAN<sub>ijt</sub></i>	0.13 (0.54)	-0.16 <sup>a</sup> (0.03)	-0.002 (0.08)
<i>Constant</i>	12.28 <sup>a</sup> (0.13)	-32.16 <sup>a</sup> (0.49)	
Observations	818071	731622	1073038
Country-year fixed effects	Yes	No	No
Country-pair fixed effects	No	Yes	Yes
Time dummies	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.70	0.83	

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 5.8: Overlapping effect across the types of RTAs

	DFE	DFE	DFE	DFE	PPML	PPML	PPML	PPML
<i>ln GDP<sub>it</sub></i>	0.77 <sup>a</sup> (0.01)	0.77 <sup>a</sup> (0.01)	0.77 <sup>a</sup> (0.01)	0.76 <sup>a</sup> (0.01)	0.81 <sup>a</sup> (0.03)	0.81 <sup>a</sup> (0.03)	0.81 <sup>a</sup> (0.03)	0.81 <sup>a</sup> (0.03)
<i>ln GDP<sub>jt</sub></i>	0.65 <sup>a</sup> (0.01)	0.65 <sup>a</sup> (0.01)	0.65 <sup>a</sup> (0.01)	0.65 <sup>a</sup> (0.01)	0.72 <sup>a</sup> (0.02)	0.72 <sup>a</sup> (0.02)	0.72 <sup>a</sup> (0.02)	0.72 <sup>a</sup> (0.02)
<i>ln Population<sub>it</sub></i>	-0.48 <sup>a</sup> (0.04)	-0.48 <sup>a</sup> (0.03)	-0.47 <sup>a</sup> (0.04)	-0.44 <sup>a</sup> (0.04)	-0.2 <sup>b</sup> (0.08)	-0.18 <sup>b</sup> (0.08)	-0.18 <sup>b</sup> (0.08)	-0.18 <sup>b</sup> (0.08)
<i>ln Population<sub>jt</sub></i>	0.39 <sup>a</sup> (0.03)	0.39 <sup>a</sup> (0.03)	0.39 <sup>a</sup> (0.03)	0.38 <sup>a</sup> (0.03)	-0.06 (0.07)	-0.06 (0.07)	-0.06 (0.07)	-0.06 (0.07)
<b>Trade creation</b>								
<i>SADC_FTA_TC<sub>ijt</sub></i>	0.55 <sup>a</sup> (0.13)	0.53 <sup>a</sup> (0.14)			0.63 <sup>a</sup> (0.11)	0.62 <sup>a</sup> (0.10)		
<i>COMESA_FTA_TC<sub>ijt</sub></i>			0.61 <sup>a</sup> (0.19)				0.37 (0.25)	
<i>ECOWAS_FTA_TC<sub>ijt</sub></i>				0.13 (0.19)				0.19 (0.18)
<b>Trade diversion</b>								
<i>SADC_FTA_TD<sub>ijt</sub></i>	-0.12 <sup>b</sup> (0.05)	-0.12 <sup>b</sup> (0.05)			0.16 <sup>b</sup> (0.08)	0.16 <sup>b</sup> (0.08)		
<i>COMESA_FTA_TD<sub>ijt</sub></i>			-0.11 <sup>b</sup> (0.05)				-0.23 <sup>c</sup> (0.12)	
<i>ECOWAS_FTA_TD<sub>ijt</sub></i>				-0.46 <sup>a</sup> (0.05)				-0.23 <sup>c</sup> (0.11)
<b>Overlapping effect</b>								
<i>SADC_FTA_EAC<sub>ijt</sub></i>		0.10 (0.3)				-0.11 (0.35)		
<i>COMESA_FTA_EAC<sub>ijt</sub></i>			-0.11 (0.26)				-0.34 (0.22)	
<i>SADC_FTA_COMESA<sub>ijt</sub></i>	-0.06 (0.12)				-0.09 (0.18)			
<i>ECOWAS_FTA_WAEMU<sub>ijt</sub></i>				0.26 (0.25)				0.23 (0.23)
<i>Constant</i>	-32.86 <sup>a</sup> (0.49)	-32.86 <sup>a</sup> (0.49)	-32.86 <sup>a</sup> (0.49)	-32.71 <sup>a</sup> (0.49)				
Observations	731622	731622	731622	731622	1073038	1073038	1073038	1073038
Country-pair fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>R</i> <sup>2</sup>	0.83	0.83	0.83	0.83				

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 5.9: Short-run, long-run and anticipatory effects

	5-year lags	10-year lags	5-year leads
$\Delta_5 SADC\_FTA_{ijt}$	-0.55 <sup>b</sup> (0.27)	0.08 (0.16)	-0.4 (0.36)
$\Delta_5 COMESA\_FTA_{ijt}$	-0.17 (0.41)	0.55 (0.54)	-0.65 (0.59)
$\Delta_5 ECOWAS\_FTA_{ijt}$	-0.24 (0.28)	-0.11 (0.22)	-0.45 (0.40)
$\Delta_5 WAEMU\_CU_{ijt}$	0.61 (0.37)	0.09 (0.29)	0.61 (0.56)
$\Delta_5 EMCCA\_PTA_{ijt}$	0.27 (0.41)	-0.13 (0.23)	1.15 (0.79)
$\Delta_5 EAC\_CU_{ijt}$	-0.64 <sup>c</sup> (0.36)	0.13 (0.31)	0.8 <sup>b</sup> (0.34)
<i>Constant</i>	0.02 <sup>a</sup> (0.00001)	0.02 <sup>a</sup> (0.0002)	0.01 <sup>a</sup> (0.00004)
Observations	528731	470526	479378
Country-year fixed effects	Yes	Yes	Yes
Country-pair fixed effects	Yes	Yes	Yes
$R^2$	0.07	0.07	0.07

Note: Robust standard errors clustered by country-pair in parentheses with <sup>a</sup>, <sup>b</sup> and <sup>c</sup> respectively significance at the 1%, 5% and 10% levels.

Table 5.10: List of SSA's RTAs

	SADC (1996)	COMESA (1994)	EMCCA (1994)	EAC (1999)	ECOWAS (1975)	WAEMU (1994)	GSP-EU	GSP-USA	GSP-NZL	GSP-CANADA
Angola	X						X	X	X	X
Burundi		X		X			X	X	X	X
DRC	X	X					X	X	X	X
Rwanda		X		X			X	X	X	X
Sao Tome and Principe							X	X	X	X
Cameroon			X				X	X	X	X
CAR			X				X	X	X	X
Chad			X				X	X	X	X
Congo			X				X	X	X	X
Equatorial Guinea			X				X	X	X	X
Gabon			X				X	X	X	X
Kenya		X		X			X	X	X	X
Tanzania	X			X			X	X	X	X
Uganda		X		X			X	X	X	X
Sudan		X					X		X	X
Djibouti		X					X	X	X	X
Eritrea		X					X	X	X	X
Ethiopia		X					X	X	X	X
Somalia							X	X	X	X
Botswana	X						X	X	X	X
Comoros		X					X	X	X	X
Lesotho	X						X	X	X	X
Madagascar	X	X					X	X	X	X
Malawi	X	X					X	X	X	X
Mauritius	X	X					X	X	X	X
Mozambique	X						X	X	X	X
Namibia	X						X	X	X	X
Seychelles	X	X					X	X	X	X
South Africa	X						X	X		X
Swaziland	X	X					X	X	X	X
Zambia	X	X					X	X	X	X
Zimbabwe	X	X					X	X	X	X
Benin					X	X	X	X	X	X
Mali					X	X	X	X	X	X
Burkina Faso					X	X	X	X	X	X
Cape Verde					X		X	X	X	X
Ivory Coast					X	X	X	X	X	X
Gambia					X		X	X	X	X
Ghana					X		X	X	X	X
Guinea					X		X	X	X	X
Guinea-Bissau					X		X	X	X	X
Liberia					X	X	X	X	X	X
Mauritania					X		X	X	X	X
Niger					X	X	X	X	X	X
Nigeria					X		X	X	X	X
Senegal					X	X	X	X	X	X
Sierra Leone					X		X	X	X	X
Togo					X	X	X	X	X	X

Source: WTO. Note: the dates of signature are in parentheses in the table. Dates of entry into force : SADC-FTA (2000), COMESA-FTA (2000), ECOWAS-FTA (2000), WAEMU-CU (2000), EMCCA-PTA (1999), EAC-CU (2000), GSP-EU (1971), GSP-USA (1976), GSP-NZL (1972), GSP-CANADA (1974).

# Conclusion générale

Une “nouvelle” géographie commerciale a particulièrement émergé depuis ces dernières décennies avec le poids de plus en plus prépondérant des pays émergents au sein de l'économie mondiale. Le basculement de la richesse mondiale au profit des PED a d'ailleurs permis l'essor du commerce Sud-Sud qui demeure l'un des principaux canaux de transmission des récents changements opérés dans les relations économiques internationales. Cette thèse a ainsi mis l'accent sur cinq aspects caractérisant les relations commerciales Sud-Sud dans le contexte d'une “nouvelle” géographie du commerce international. Pour ce faire, nous avons particulièrement examiné les échanges commerciaux entre les BRICs et les pays d'ASS pour démontrer au mieux les spécificités présentes dans cette nouvelle dimension du commerce international.

Le premier chapitre étudie les facteurs explicatifs des flux commerciaux entre chaque BRIC et l'ASS compte tenu de l'impressionnant essor des relations économiques entre eux depuis ces dernières décennies. Nous avons ainsi identifié les caractéristiques propres à ces échanges commerciaux par le biais de variables d'interaction relatives à la présence de relations commerciales entre lesdits pays associée des variables de contrôle traditionnellement utilisées. Les résultats suggèrent la présence d'une hétérogénéité au sein même des BRICs concernant les déterminants

des échanges commerciaux avec l'ASS. D'un côté, trois profils (Brésil, Russie, Inde-Chine) apparaissent au niveau des exportations bilatérales africaines alors que pour les exportations des BRICs vers l'ASS, chaque BRIC admet un profil relativement différent. Par exemple, nous retenons ici l'impact particulièrement significatif des pays riches en ressources naturelles sur les relations commerciales de la Chine par rapport aux autres BRICs sur la période récente.

Afin de saisir l'importance de la nature des partenaires commerciaux dans les relations commerciales Sud-Sud, le second chapitre propose de valider empiriquement l'idée selon laquelle les flux commerciaux Sud-Sud s'avèrent être un facteur encourageant la diversification du commerce des PED. Nous avons essayé empiriquement de contribuer à la littérature relative aux déterminants de la croissance des échanges en termes de diversification géographique (ou marge extensive géographique). Nous avons ainsi comparé l'effet des exportations de chaque BRIC vers l'ASS sur le commerce intra-africain et surtout en termes de nouvelles destinations à l'exportation en Afrique. Nous trouvons que, quels que soient les BRICs, ces exportations vers l'ASS favorisent significativement le commerce intra-africain en augmentant, en moyenne, le nombre de nouveaux partenaires commerciaux régionaux. Nos résultats confirment, d'ailleurs, la place singulière de la Chine dans le processus de diversification géographique des échanges intra-africain par rapport aux autres BRICs.

Le troisième chapitre analyse empiriquement l'existence d'une éventuelle réorientation du commerce des ex-colonies vers la Chine au détriment des anciennes puissances coloniales à la suite de leur indépendance. Nous avons estimé, d'une part, l'effet moyen sur les flux commerciaux bilatéraux à travers des variables retraçant les relations entre les ex-colonies et la Chine pour chaque année depuis l'indépendance. Puis nous avons montré graphiquement année par année cet effet dans le temps. D'autre part, nous avons mené des simulations à partir de deux scénarios différents

afin de montrer l'existence d'une redistribution du commerce envers la Chine. Les résultats soulignent que le niveau actuel des flux commerciaux entre les anciennes colonies et la Chine semble être le résultat de la croissance de la taille économique de la Chine, de sa politique d'ouverture vers l'extérieur et d'un effet redistributif depuis l'indépendance. Ainsi, l'accroissement des coûts commerciaux entre les anciennes colonies et les puissances coloniales a grandement favorisé la réorientation de ces flux commerciaux vers la Chine.

Quant aux deux derniers chapitres de cette thèse, ils s'intéressent à la relation entre la politique économique extérieure et le commerce international. Le quatrième chapitre explore le concept de diplomatie économique dans le cas de la Chine avec ses partenaires commerciaux. Plus précisément, nous examinons l'impact de la politique de la Chine unique sur les flux commerciaux bilatéraux chinois et taiwanais. Nous l'avons approximée à partir des votes de la résolution onusienne de 1971 relative à la reconnaissance officielle de la RPC et de la présence de relations diplomatiques avec celle-ci. Les résultats apportent les preuves empiriques suivantes. D'une part, l'on observe que quelle que soit la nature du vote, cette résolution a permis d'augmenter, en moyenne, aussi bien les échanges bilatéraux chinois que taiwanais depuis son adoption. D'autre part, lorsque les pays ont des relations diplomatiques avec la Chine, nous constatons une sensible amélioration du commerce chinois tandis qu'un effet de détérioration est présent pour les flux commerciaux taiwanais, principalement avec les anciennes colonies en développement. En d'autres termes, l'on remarque que la politique de la Chine unique a plutôt été un outil au service du développement économique chinois tourné vers l'extérieur qu'un moyen d'isoler économiquement et politiquement Taiwan dans les relations commerciales.

Le cinquième et dernier chapitre évalue empiriquement les effets des AP Sud-Sud sur le commerce des PED dans le cas de l'ASS. Nous estimons notamment les effets

moyens des AP africains sur le commerce intra-zone et avec les pays tiers en portant une attention toute particulière aux types d'accords commerciaux, à la nature des partenaires commerciaux extérieurs, au chevauchement de ces AP et à leur mise en œuvre dans le temps. Les résultats nous conduisent à affirmer la pertinence de la prise en compte de l'hétérogénéité des AP dans les estimations. D'une part, nous constatons la supériorité de certaines ZLE et UD africaines sur les ZEP régionales mais aussi sur les SGP au niveau des échanges. Ensuite, ces AP tendent à augmenter davantage les flux commerciaux avec la Chine qu'entre eux alors que l'on aperçoit un détournement du commerce avec les pays de l'OCDE. D'autre part, la participation à plusieurs AP africains n'a aucune influence sur le commerce intra-zone dans nos quatre situations de chevauchement.

Les contributions apportées par cette thèse ont permis de discerner les premiers éléments caractérisant la relation entre le commerce Sud-Sud et cette "nouvelle" géographie commerciale, et essentiellement dans les relations commerciales entre les BRICs et l'ASS. Pour autant, ces balises posées nous incitent à approfondir ce domaine de recherche en devenant compte tenu du contexte international en adoptant des approches se situant encore plus à la frontière de la littérature économique. D'une part, le récent changement de modèle de croissance de l'économie chinoise laisse clairement présager des répercussions surtout pour les pays qui ont bénéficié le plus de cette coopération Sud-Sud, à savoir les pays abondants en ressources naturelles. En effet, les premiers signes se font sentir avec la chute des cours de matières premières, celle des recettes d'exportations puis celle des réserves de change mettant ainsi à mal le tissu politico-social de ces économies. D'autre part, la littérature économique développe sans cesse de nouveaux champs d'investigation nous poussant à dépasser nos cadres d'analyse habituels. D'un côté, les chaînes de valeur mondiales dans le commerce (Elms et Low, 2013), les caractéristiques des firmes exportatrices (Harrison

et *al.*, 2014) sont autant d'éléments venant nourrir la compréhension de la mutation des relations commerciales. D'un autre côté, l'impact des sanctions économiques sur les échanges (Crozet et Hinz, 2016), la possible influence des différends commerciaux sur le commerce (Bown et Reynolds, 2015) peuvent être déterminants dans l'explication du rôle de la politique économique extérieure des partenaires commerciaux.

## **Commerce Sud-Sud et “nouvelle” géographie du commerce international : le rôle des économies émergentes**

Cette thèse a pour objet d'examiner cinq aspects de la relation entre le commerce Sud-Sud et la “nouvelle” géographie du commerce international en portant une attention toute particulière aux liens qui existent entre les BRICs (Brésil, Russie, Inde, Chine) et l'Afrique sub-Saharienne (ASS) puis entre la Chine et l'ASS. La première partie s'attache à démontrer certaines caractéristiques relatives à la mutation des relations commerciales Sud-Sud. Dans le premier chapitre, l'hétérogénéité au sein même des BRICs est confirmée à partir d'un certain nombre de facteurs explicatifs des flux commerciaux bilatéraux avec l'ASS. Dans le second chapitre, les flux commerciaux Sud-Sud semble jouer un rôle déterminant dans la diversification géographique du commerce intra-Africain en termes de nouveaux partenaires commerciaux. Dans le troisième chapitre, l'idée d'une réorientation du commerce des ex-colonies depuis l'indépendance vers la Chine au détriment des anciennes puissances coloniales a été validée empiriquement. Quant à la deuxième partie, elle s'intéresse aux liens entre la politique économique extérieure et le commerce Sud-Sud. Les résultats du quatrième chapitre soulignent l'impact significatif de la “politique de la Chine unique” sur les flux commerciaux chinois et taiwanais par le biais de la diplomatie économique. Les estimations du cinquième chapitre confirment l'hétérogénéité des effets moyens et dans le temps des accords commerciaux africains sur le commerce selon le type d'accords préférentiels, la nature des partenaires ainsi que leur chevauchement.

Mots-clés : commerce Sud-Sud, diversification géographique, réorientation des échanges, diplomatie économique, accords régionaux, Afrique sub-Saharienne, BRICs, Chine, modèle de gravité.

## **South-South trade and “new” geography of international trade : the role of emerging economies**

This thesis emphasises five aspects of relations between South-South trade and “new” geography of international trade. We particularly pay attention to the links between BRICs (Brazil, Russia, India, China) and sub-Saharan Africa (SSA) but also between China and SSA. The first part attempts to demonstrate some characteristics concerning the mutation of South-South trade relations. In the Chapter 1, the heterogeneity of BRICs is confirmed from some factors of bilateral trade flows with SSA. In the Chapter 2, the South-South trade flows play a significant role in the geographic diversification of intra-African trade in terms of new trading partners. In the Chapter 3, the assumption of a trade reorientation of ex-colonies since independence with China at the expense of former colonial powers has been empirically validated. The second part studies the linkages between the foreign economic policy and South-South trade. The findings of the Chapter 4 highlight the significant impact of the “One China policy” on Chinese and Taiwanese trade flows through the economic diplomacy. The estimates of the Chapter 5 confirm the heterogeneous average effects but also over time of the African trade agreements on trade according to the nature of trading partners, the kinds of trade agreements and their overlapping.

Key words: South-South trade, geographic diversification, trade reorientation, economic diplomacy, regional trade agreements, sub-Saharan Africa, BRICs, gravity models.

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