



Complexity, diplomatic relationships and business creation : a cross-regional analysis of the development of productive knowledge, trade facilitation and firm entry in regional markets

Bogdan Meunier

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Thèse en vue de l'obtention du grade de docteur en économie

Bogdan MEUNIER

Complexity, diplomatic relationships and business creation

A cross-regional analysis of the development of
productive knowledge, trade facilitation and firm
entry in regional markets

Sous la direction de Madame la professeure Mathilde MAUREL

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RESUME

Notre thèse adopte une approche multidimensionnelle aux questions de connaissances productives, obstacles au commerce et à la diplomatie, ainsi que sur la création d'entreprises en identifiant de nouvelles perspectives et méthodes pour trois zones géographiques distinctes : Europe centrale et orientale, Afrique du Nord et Fédération de Russie. Nos résultats fournissent de nouvelles perspectives et méthodologies sur les formes d'intégration efficaces, identifiant les caractéristiques distinctes de chaque domaine, mais également explorant les composantes de chaque pays pour une connaissance plus approfondie des spécificités et de leur évolution au cours des dernières décennies.

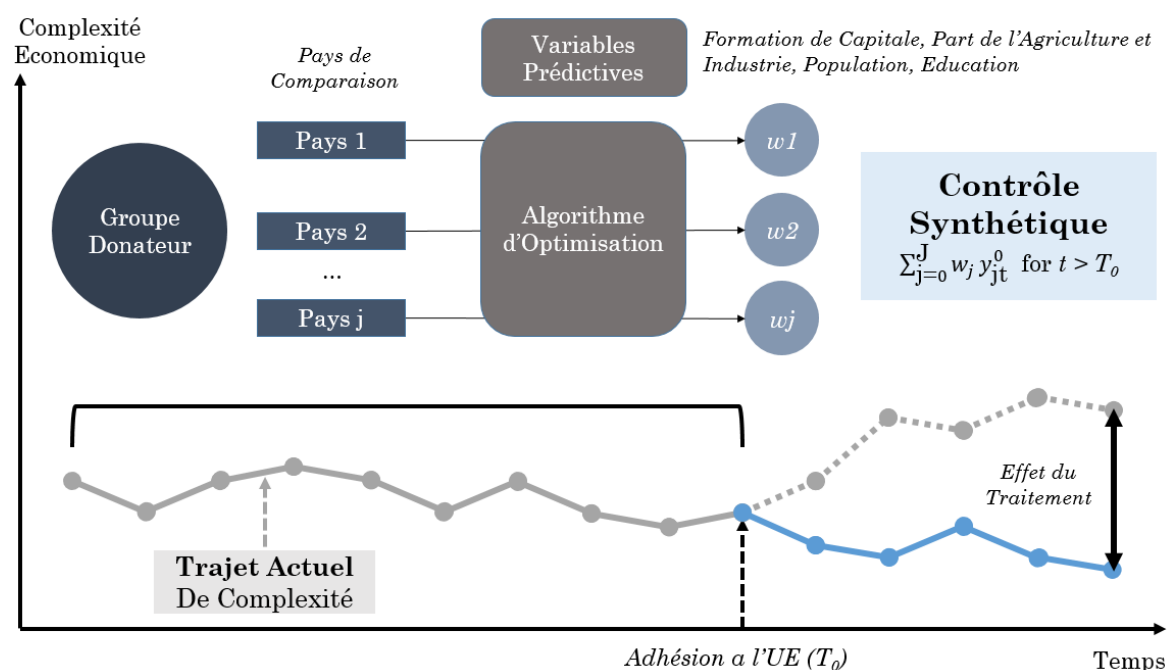
Dans notre premier chapitre, nous concentrons notre analyse aux impacts de l'intégration régionale sur les connaissances productives et sur la manière dont les pays appartenant à un espace économique intégré peuvent tirer parti des externalités positives du capital humain des autres États de leur région. En examinant la complexité des produits fabriqués et exportés par un pays donné, nous pouvons obtenir des informations précises sur l'économie de ce pays et sur la dynamique du marché qu'il partage avec les états voisins. A travers cette ligne de recherche, nous apportons une nouvelle analyse de la complexité économique en liant son évaluation au processus d'intégration régionale. Dans ce cadre, il devient particulièrement important d'étudier les unions économiques, car les effets de l'intégration apportent des conséquences répandues sur les dynamiques de compétitivité du commerce. À cet égard, l'Union européenne (UE) a été l'un des principaux domaines d'étude de ces dynamiques en raison de sa nature unique en tant que l'espace économique le plus intégré au monde. L'UE englobe une série de politiques de libéralisation touchant le commerce, les investissements étrangers, les barrières tarifaires et qui garantit la libre circulation des personnes et la propriété intellectuelle. L'UE abrite également une monnaie unique au sein de la zone euro, partagée entre ses membres et l'un des aspects les

plus tangibles de l'intégration européenne. En 2004, le premier groupe de pays de l'ancien bloc socialiste est entré dans l'Union européenne : les États baltes (Lituanie, Lettonie et Estonie), la Pologne, la République tchèque, la Slovaquie, la Slovénie et la Hongrie. Trois ans plus tard, en 2007, deux autres nouveaux pays de cette région (Bulgarie et Roumanie) sont devenus membres de l'UE. L'Union européenne a ouvert les portes des parties centrale et orientale du continent dans le but déclaré de réintégrer ces pays dans la famille européenne, en les aidant à consolider leur démocratie. Sur le plan économique, les objectifs de l'adhésion à l'UE peuvent se résumer en deux dimensions principales. D'une part, la réglementation européenne vise à élever le niveau de vie des adhérents. Ces objectifs ont été largement atteints : neuf ans après l'intégration, le PIB par habitant a augmenté de manière positive dans les nouveaux États membres, de même que la plupart des autres indicateurs socio-économiques (consommation privée, inflation, investissement, emploi, taux de rémunération, etc.). Le deuxième aspect de l'adhésion européenne vise à renforcer la compétitivité en stimulant un marché ouvert grâce à la liberté des échanges et à l'accès à une monnaie commune. En se concentrant sur cette dernière dimension, notre analyse aborde une nouvelle perspective de l'impact de l'intégration sur la compétitivité à travers la complexité de l'espace de produits exportés par les nouveaux pays membres. Le volume des exportations et des échanges commerciaux s'est développé au cours des neuf premières années de la période d'adhésion à l'UE dans tous les nouveaux pays, l'augmentation la plus importante de ce type ayant été enregistrée dans le cas des trois pays baltes. Bien que cette augmentation apporte une partie de la réponse au déploiement du commerce sur le marché européen élargi, notre étude approfondit l'analyse des composants clés du commerce et de la complexité qui en découle. Un nouvel outil de recherche académique de ces dernières années, l'utilisation de la complexité économique vise à proposer une nouvelle approche dans ce contexte, en permettant de quantifier le niveau de

développement industriel d'un pays. Développé conjointement par Cesar A. Hidalgo, du MIT Media Lab et Ricardo Hausmann, de la Kennedy School of Government de l'Université Harvard, L'indice de complexité économique (ECI) analyse la sophistication des produits exportés par un pays donné en adoptant une approche en deux dimensions distinctes : Diversité (le nombre de produits manufacturés pour un certain pays) et Ubiquité (le nombre de pays qui manufacturent un certain produit). Cet indice, prédicteur robuste du développement économique, est calculé par pays et années et permet une approche analytique de la composition des exports des états de notre étude. Afin d'évaluer l'évolution des transformations qualitatives intervenues depuis l'adhésion à l'UE des nouveaux pays membres, nous proposons d'analyser comment les niveaux de complexité économique de ces pays ont évolué depuis leur adhésion en testant, à travers une méthodologie de contrôle synthétique, la différence entre complexité réalisée et une contrepartie synthétique. Cette dernière représente une trajectoire de développement simulée d'un pays donné dans l'hypothèse où celui-ci n'a pas rejoint l'Union Européenne. Les contreparties synthétiques sont créées en utilisant un algorithme d'optimisation basé sur une série de variables prédictives macroéconomiques qui attribuent des pondérations pour chaque pays à partir d'un groupe de donateurs d'économies comparables non traitées (c'est-à-dire non membres de l'UE). Les variables prédictives macroéconomiques utilisées sont les suivantes: l'indice de complexité économique avant accession (année par année), la part de formation brute de capital (PPA actuelles) et population tirées des tableaux Penn World 9.0 ainsi que part de la valeur de l'agriculture dans la valeur ajoutée (% du PIB), la part de l'industrie dans la valeur ajoutée (% du PIB), les taux brut de scolarisation secondaire, (% , les deux sexes) et le taux brut de scolarisation tertiaire (% , les deux sexes) d'après les indicateurs économiques de la Banque mondiale. Les données sont obtenues pour la période 1995-

2015 incluent les deux années distinctes d'adhésion des nouveaux membres (2006 pour la Roumanie et la Bulgarie et 2004 pour les autres pays).

Figure R.1. Résumé de la méthode de contrôle synthétique

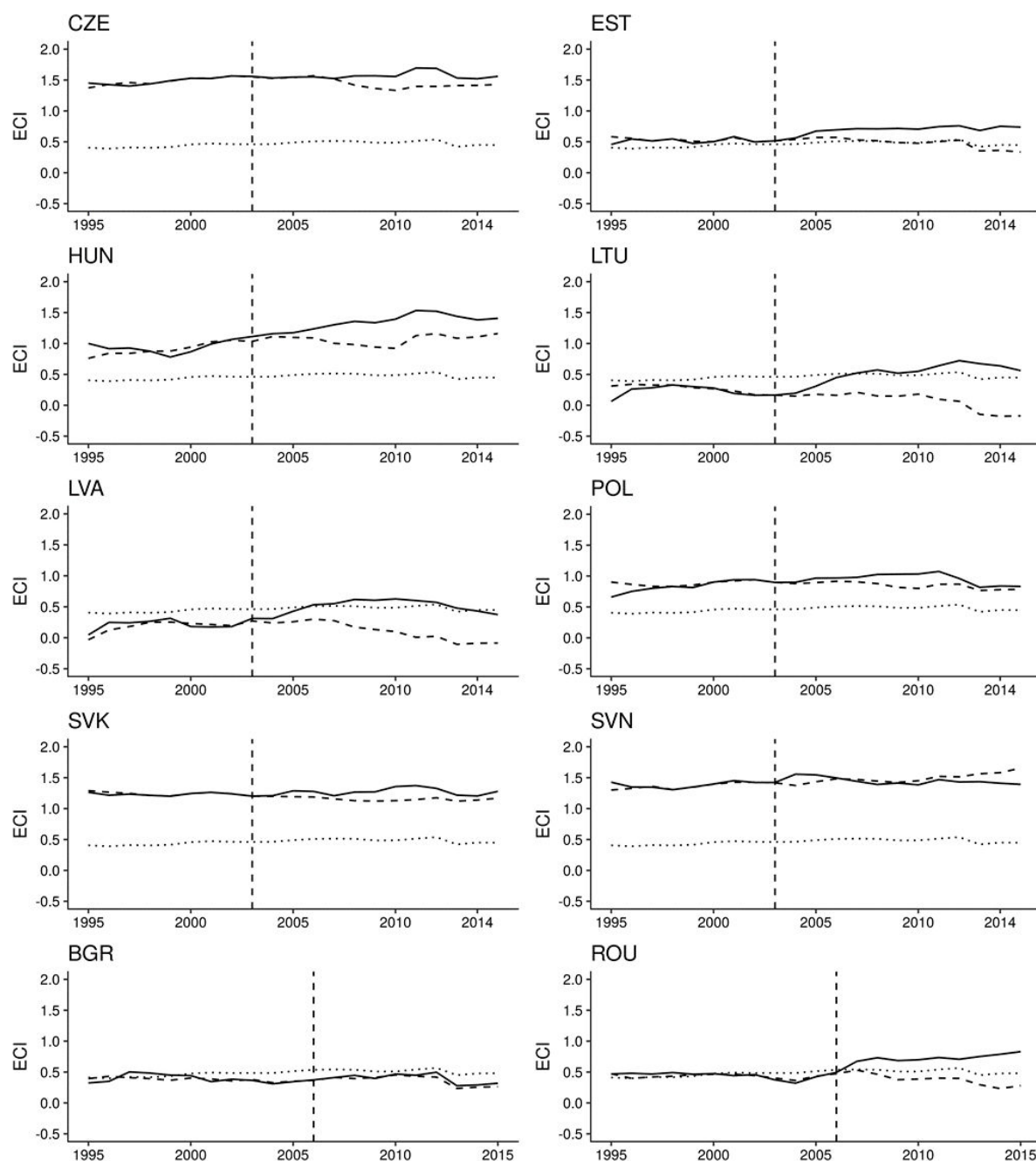


En d'autres termes, le parcours simulé de la complexité est une combinaison pondérée des parcours réalisés par d'autres pays non membres de l'UE au cours de la période précédant l'adhésion et fournit une représentation fidèle du trajet qu'aurait pris un nouveau membre de l'UE si celui-ci n'avait pas adhéré. En comparant la contrepartie synthétique à la complexité réelle réalisée de chaque pays d'Europe centrale et orientale, nous avons pu déterminer l'écart de complexité entre les deux scénarios au cours des années suivant leur adhésion (jusqu'en 2015) et identifier les pays pour lesquels l'accès à l'Union européenne a fourni une différence tangible à leur espace de produits d'exportation.

Les résultats de notre analyse de contrôle synthétique sont présentés ci-dessous, pour chaque pays ayant adhéré à l'Union européenne dans le cadre des deuxièmes et troisièmes vagues d'intégration : le graphe S.1 présente l'évolution de l'indice de complexité économique (ICE) de chaque pays (trait continu), ainsi que son équivalent synthétique de

contrôle (long trait pointillé) et la moyenne non pondérée de l'échantillon (petit trait pointillé).

Figure R.2. Contrôle synthétique de la complexité économique

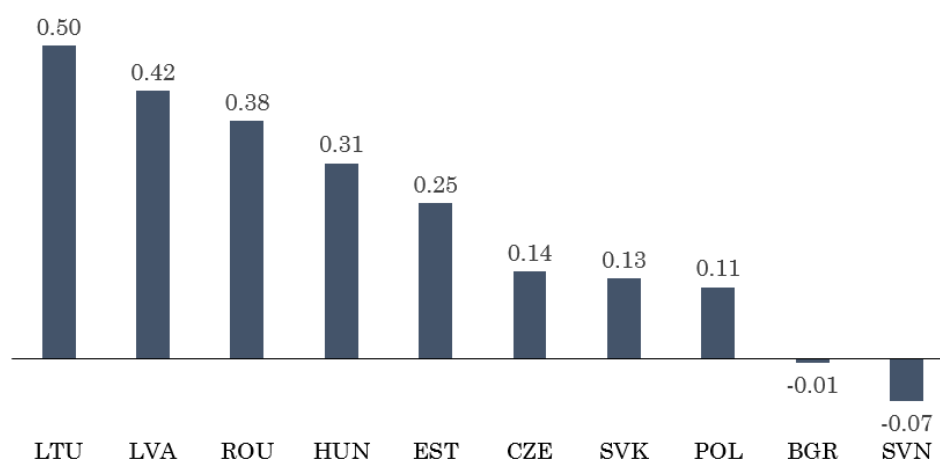


Noir : Complexité réalisée
 Long trait pointillé : Contrôle synthétique de complexité économique
 Petit trait pointillé : Moyenne du groupe

Premièrement, nous remarquons que, dans tous les cas, le contrôle synthétique suit beaucoup mieux le comportement de l'ECI avant 2004/2007 que la moyenne de

l'échantillon. En outre, le pays et son homologue synthétique évoluent parallèlement avant l'adhésion à l'UE en ce qui concerne leur complexité économique. Nous voyons qu'après l'entrée dans l'UE, une distance commence à apparaître entre complexités réelles et leurs versions synthétiques, indiquant que les économies des nouveaux membres deviennent plus complexes que celles des contrefactuelles. Les résultats sont particulièrement remarquables pour cinq pays, dont les trois États baltes : l'Estonie, la Lituanie, la Lettonie, ainsi que pour la Hongrie et la Roumanie. Notre méthodologie montre pour ces pays qu'après leur adhésion à l'UE, leurs économies sont devenues plus complexes qu'elles ne l'auraient été autrement, s'ils n'étaient pas devenus membres du marché commun. Les résultats sont moins cohérents pour la République tchèque, la Pologne, la Slovaquie, la Slovénie et la Bulgarie, où les changements sont relativement mineurs et où la complexité économique post-2006 est restée très proche du contrôle synthétique. Nous notons cependant que quatre de ces pays (République tchèque, Pologne, Slovaquie, Slovénie) ont commencé avec des niveaux de complexité économique plus élevés que le reste du groupe (nettement au-dessus de la moyenne du groupe en 1995), ce qui indique que l'intégration à l'Union européenne n'a profité qu'aux pays dont la complexité initiale du produit était relativement faible. La seule exception est la Bulgarie qui a commencé avec des niveaux de complexité relativement moins élevés et dont l'adhésion à l'Union européenne n'a pas eu pour effet d'augmenter considérablement la valeur de son indice de complexité.

**Figure R.3. Moyenne de la complexité économique contre contrôle synthétique
(Année d'adhésion – 2015)**



Nos résultats indiquent un effet de convergence observé pour les ECI, où l'adhésion à l'UE a profité le plus aux pays dont les économies étaient initialement moins complexes. En revanche, pour les pays qui exportaient déjà des produits complexes avant l'adhésion à l'UE, les effets marginaux étaient moins importants. À partir de ces résultats, l'adhésion à l'UE peut être considérée comme un catalyseur de la complexité économique qui constitue une première amélioration significative pour les pays dont les exportations de produits ne sont pas développées. La seule exception à notre échantillon est la Bulgarie, qui a maintenu de faibles niveaux de complexité économique à la fois avant et après l'adhésion, sans différence significative entre les trajectoires réelles et synthétiques.

Dans notre deuxième chapitre, nous avons élargi la portée géographique de notre étude sur l'intégration régionale en incluant l'Afrique du Nord et le reste de l'Europe dans nos économies d'Europe centrale et orientale. Pour ces pays, et en particulier pour les pays du Maghreb, une intégration régionale plus profonde est cruciale pour le développement économique. Malgré des liens historiques et linguistiques étroits, les économies nord-africaines restent pour la plupart isolées l'une de l'autre et de l'Union européenne (UE), qui est l'un de leurs principaux partenaires commerciaux. Un rapport récent de la

Commission économique des Nations Unies pour l'Afrique (CEA) a estimé qu'ils prenaient part dans moins de 50% de leur potentiel commercial. Pourtant, la création de l'Union du Maghreb arabe en 1989 aurait dû être le point de départ de relations économiques plus étroites en Afrique du Nord par le biais de la libéralisation du commerce, mais les barrières commerciales sont toujours présentes. Les pays d'Afrique du Nord sont non seulement isolés les uns des autres, ils sont également coupés du reste du monde et constituent l'une des zones les moins intégrées de la zone des échanges mondiaux.

Instinctivement, nous pouvons imputer les tarifs élevés à ce manque d'intégration. Cependant, des découvertes récentes dans la littérature spécialisée suggèrent qu'il ne s'agit peut-être que d'une partie de l'explication. Les échanges internationaux toujours plus libéralisés ont amené les économistes à repenser les déterminants de telles intégrations commerciales sous-optimales. Les mesures non tarifaires et les politiques de facilitation des échanges ont récemment occupé une place importante dans la théorie économique. Le message du compilateur de rapports de l'Indice de performance logistique révèle l'importance des interconnexions pour la concurrence : les chaînes de production étant réparties sur plusieurs pays, il est nécessaire de disposer d'infrastructures et de services de facilitation du commerce solides et fiables. Un investissement politique insuffisant dans ce domaine peut en effet conduire à l'exclusion de certains réseaux de production mondiaux nécessitant une chaîne d'approvisionnement réactive.

À l'échelle mondiale, selon le classement de l'Indice de performance logistique, les pays les moins performants sont des pays sans littoral ou en guerre civile. Les pays d'Afrique du Nord, malgré leur accès à la mer, sont moins performants en termes de facilitation des échanges. Des pays comparables d'Europe centrale et orientale ont été capables de créer des infrastructures commerciales efficaces et de restructurer leurs échanges de manière significative après la chute du mur de Berlin le 9 novembre 1989 et

la dissolution du bloc soviétique. Les entreprises occidentales ont pénétré les marchés de l'Est et en contrepartie, les marchés occidentaux sont aujourd'hui plus ouverts pour les produits de l'Est. La réorientation des échanges est l'un des « sept faits stylisés sur dix ans de transition » de Nauro Campos et de Fabrizio Corricelli (2002).

Simultanément à cette réorientation économique, ces groupes de pays ont assisté à la naissance de nouvelles relations diplomatiques ainsi qu'au renouvellement des anciennes liaisons. La promotion des exportations est souvent explicitée comme l'un des objectifs d'une mission diplomatique étrangère. Par exemple, la France voit explicitement que le rôle (futur) des ambassades diffère selon le niveau de développement du partenaire bilatéral, où, notamment dans le cas des économies émergentes, « il faut faire fructifier les relations ». Andrew Rose (2007) a calculé l'impact des missions étrangères sur les exportations en utilisant un échantillon représentatif de 22 grands exportateurs et a constaté un effet significatif positif de l'avantage de représentations permanentes étrangères sur les exportations unilatérales. Afman et Maurel (2010), qui s'appuyaient sur le modèle Rose pour examiner le commerce entre l'Organisation de coopération et de développement économiques (OCDE) et les pays en transition, ont constaté qu'ouvrir une ambassade équivalait à une réduction tarifaire ad valorem de 2 à 8%. Ce chapitre adopte une approche comparative identifiée avec des limites géographiques définies, en se concentrant sur le commerce dans un échantillon de pays d'Afrique du Nord, d'économies en transition et de leurs principaux partenaires commerciaux. Notre échantillon a pour objectif de refléter une région dotée d'un statut politique et judiciaire spécifique et comprenant des pays d'Europe orientale ayant vocation à intégrer l'Union européenne et l'Afrique du Nord, qui fait partie du voisinage proche européen. Dans cet espace, nous nous concentrons sur l'identification des déterminants du commerce bilatéral entre les pays de la région et sur le fonctionnement des mécanismes de facilitation des échanges visant à promouvoir les flux d'importation et

d'exportation. En particulier, notre approche tente de comprendre la facilitation des échanges à travers l'optique de la présence diplomatique et la manière dont l'existence d'agents ambassadeurs affecte les flux commerciaux entre plusieurs pays. D'un point de vue politique, il est intéressant de voir si les pays qui sont restés « diplomatiques » avec une qualité réduite de leur infrastructure logistique et leurs institutions ont profité des opportunités d'exportation potentielles et ont été exposés à l'effet de détournement du commerce.

D'un point de vue méthodologique, nous développons un modèle économétrique qui implémente une équation de gravité à effets fixes à laquelle nous intégrons les indicateurs conventionnels de la littérature boursière aux côtés d'un groupe de variables sélectionnées reflétant les relations diplomatiques entre plusieurs partenaires commerciaux. Notre recherche s'inspire du modèle de gravité modifié de Hanousek et Kočenda (2014) dont l'analyse en structure panel nous permet d'inclure des effets fixes par paires et un contrôle de l'hétérogénéité des paires dans la relation bilatérale et des caractéristiques typiques invariantes dans le temps entre différentes paires de pays. Cette approche résout le problème des estimations biaisées dues aux variables omises, comme le soutiennent Cheng et Wall (2005). Les variables explicatives comprennent les coûts monétaires directs et les frais associés aux exportations et importations de biens échangés, ainsi que d'autres éléments de friction liés aux échanges à l'étranger : les coûts liés aux marchandises pour l'exportation et l'importation, le nombre de documents juridiques requis et le temps moyen nécessaire pour expédier un conteneur dans chaque pays. À ceux-ci s'ajoute un groupe d'indicateurs de facilitation du commerce mesurant la qualité de la logistique, des infrastructures et des services liés aux activités commerciales. De manière comparative, nous soulignons l'effet de *Doing Business* et des infrastructures logistiques sur l'établissement de nouveaux liens commerciaux et le renforcement de l'action

diplomatique. Dans la deuxième étape de notre méthodologie, nous examinons l'impact de la diplomatie sur le commerce en prenant en compte la représentation bilatérale dans un pays commerçant que nous définissons comme la nomination d'un responsable (chargé d'affaires ou ambassadeur) chargé de promouvoir et de défendre intérêts nationaux. Notre contribution empirique à la question des missions et des exportations à l'étranger est double : nous comparons d'une part les opportunités commerciales manquantes en raison du manque de missions à l'étranger et d'autre part, celles qui découlent de la mauvaise qualité des infrastructures, tant matérielles que matérielles, visant à faciliter les affaires dans deux régions de l'UE voisine.

A travers ce système, nous avons pu quantifier et évaluer l'incidence de la présence diplomatique sur les relations commerciales. Pour l'analyse initiale des performances de facilitation des échanges, notre modèle valide les résultats standard de la théorie du commerce international avec des estimations robustes de la distance, du coût des échanges et des performances logistiques pour la promotion des exportations. La réduction des coûts et des frais pour les échanges transfrontaliers (notamment les frais liés à l'exportation et à l'importation d'un conteneur de 20 pieds), le nombre de documents légaux, le temps moyen nécessaire pour expédier un conteneur, ainsi que la qualité de la logistique, des infrastructures et des services liés aux activités commerciales, expliquent l'écart entre l'effet fixe bilatéral moyen de l'Afrique du Nord et des PECO, nettement plus important pour le deuxième groupe. Globalement, la différence observée dans les échanges entre les pays d'Afrique du Nord et les pays d'Europe centrale et orientale peut être attribuée à la qualité des infrastructures, tant matérielles que matérielles, dans laquelle la diplomatie joue un rôle important dans l'amélioration de la logistique commerciale. La différence observée dans les échanges entre les pays d'Afrique du Nord et les pays européens en transition peut donc être potentiellement attribuée à la qualité des infrastructures immatérielles et des

infrastructures en dur de ces pays. Du point de vue de la diplomatie, nos résultats indiquent que la présence d'un ambassadeur est hautement significative pour toutes les spécifications, indiquant un impact positif du service extérieur sur la facilitation des échanges. L'ouverture d'une ambassade joue un rôle significatif dans l'amélioration de la logistique commerciale dans ces pays, telle que mesurée par les indicateurs Doing Business et LPI de la Banque mondiale. Les résultats sont valables pour toutes les exportations bilatérales, un représentant des affaires étrangères améliorant les volumes commerciaux tant pour le pays importateur que pour le pays exportateur.

Dans les tableaux ci-dessous, nous résumons les résultats des différentes régressions, en mettant l'accent sur les variables d'intérêt liées à la facilitation des échanges ainsi que nos variables diplomatiques.

Tableau R.1. Résultats économétriques : LPI

Spécification utilisant:	Coefficient Pays Exportateur	Coefficient Pays Importateur	Coefficient Ambassadeur I → X	Coefficient Ambassadeur X → I
LPI Score	10.94 *** (34.66)	6.035 *** (19.17)	0.652 *** (4.16)	0.308 * (1.96)
Customs	8.830 *** (33.54)	4.775 *** (18.19)	0.797 *** (5.05)	0.405 * (2.57)
Infrastructure	7.887 *** (30.11)	4.204 *** (16.09)	0.824 *** (4.99)	0.437 ** (2.65)
LogisticsServices	9.197 *** (31.44)	5.081 *** (17.44)	0.741 *** (4.55)	0.363 * (2.23)
Tracking	9.971 *** (33.53)	5.343 *** (18)	0.721 *** (4.54)	0.352 * (2.21)
Timeliness	13.90 *** (34.98)	7.259 *** (18.33)	0.689 *** (4.42)	0.342 * (2.19)

* p < 0.05, ** p < 0.01, *** p < 0.001

Customs : l'efficacité du dédouanement des douanes et des frontières
Infrastructure : la qualité des infrastructures de commerce et de transport
LogisticsServices : compétence et qualité des services logistiques - camionnage, expédition et courtage en douane
Tracking : possibilité de suivre et de suivre les envois.
Timeliness : fréquence à laquelle les envois parviennent aux destinataires dans les délais de livraison prévus ou prévus

Tableau R.2. Résultats économétriques : Doing Business

Spécification utilisant:	Coefficient Pays Exportateur	Coefficient Pays Importateur	Coefficient Ambassadeur I → X	Coefficient Ambassadeur X → I
CostExport	-1.279 *** (-7.28)	-0.324 (-1.84)	1.946 *** (9.89)	1.171 *** (5.95)
CostImport	-1.803 *** (-10.46)	-0.445 ** (-2.58)	1.819 *** (9.36)	1.102 *** (5.67)
TimeExport	-2.437 *** (-20.53)	-0.874 *** (-7.35)	1.441 *** (8)	0.966 *** (5.36)
TimeImport	-2.219 *** (-22.90)	-0.934 *** (-9.63)	1.197 *** (6.74)	0.772 *** (4.35)
DocExport	-3.505 *** (-21.54)	-1.927 *** (-11.87)	1.340 *** (7.53)	0.742 *** (4.17)
DocImport	-3.370 *** (-22.78)	-1.413 *** (-9.57)	1.343 *** (7.61)	0.911 *** (5.17)

* p < 0.05, ** p < 0.01, *** p < 0.001

Cost : les coûts liés aux marchandises d'exportation et d'importation en dollars américains,

Time : le temps moyen nécessaire pour expédier un conteneur pour chaque pays de notre échantillon

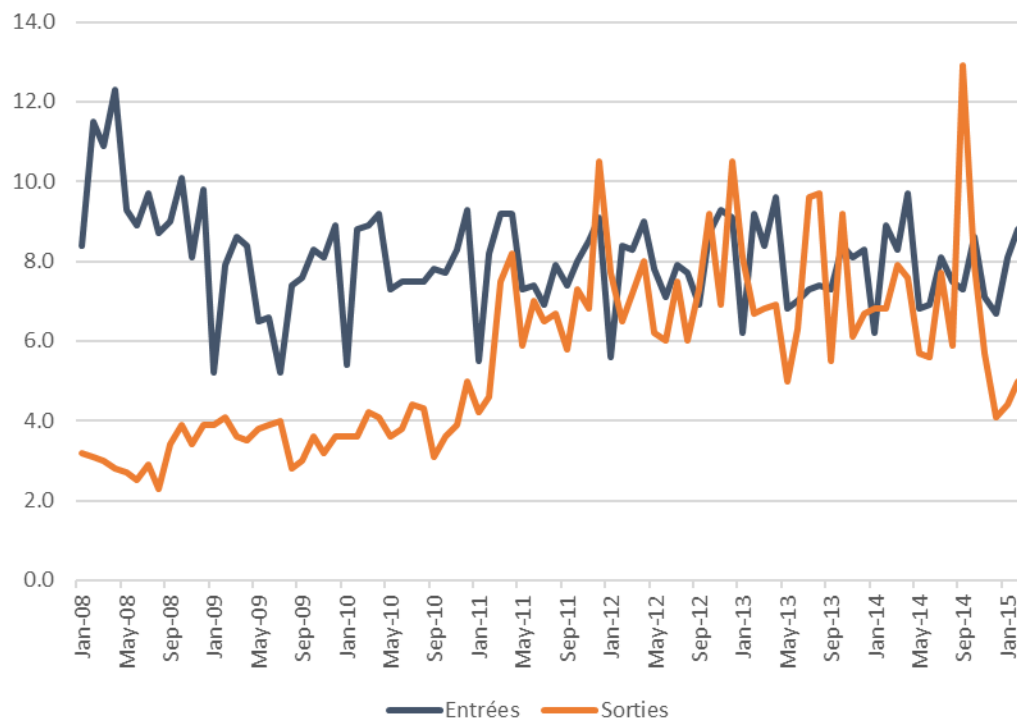
Doc : le nombre de documents légaux requis pour exporter et importer

Ces résultats ont des implications politiques dans la mesure où ils contribuent au débat sur le rôle relatif des instruments de politique commerciale traditionnels - mesures tarifaires et non tarifaires - et des mesures de facilitation des échanges, ces dernières étant de puissants moteurs de l'intégration du commerce régional. Plus spécifiquement, ils suggèrent que la mise en œuvre de l'Accord sur la facilitation des échanges (AFT), qui aiderait à se rapprocher de la valeur limite des indicateurs LPI ou *Doing Business* pour les PECO, pourrait permettre aux pays d'Afrique du Nord de parvenir à une meilleure intégration des échanges en réduisant leurs coûts commerciaux. L'ouverture des ambassades en tant que mesures d'accompagnement pourrait donc renforcer l'AFE dans la promotion de l'intégration du commerce régional.

Dans notre troisième et dernier chapitre, nous analysons un aspect économique complémentaire, également au cœur de la dynamique du commerce : la création d'entreprises. Il est généralement admis que le développement des PME est essentiel pour l'émergence de valeurs et normes liées à l'économie de marché. Pour la portée de cette recherche, nous avons choisi de nous concentrer sur la fédération de Russie, qui fournit une perspective importante sur les déterminants de l'entrée et de la sortie d'entreprises dans le marché du pays. Ce choix nous permet de donner une perspective sur la création d'entreprises au niveau national afin de comprendre comment les politiques nationales peuvent affecter une vaste zone géographique telle que celle occupée par la Russie. Globalement, le pays se caractérise par de très faibles entrées d'entreprises par rapport aux normes internationales, même si celui-ci reste relativement performant en termes de contraintes formelles. Cependant, un état de droit fragile est nuisible au bon développement des entreprises russes, comme le témoigne le faible désir d'investir dans le pays et un climat général d'incertitude et d'incohérence dans l'application des politiques existantes. Les problèmes des entreprises se traduisent par la faible protection des investisseurs minoritaires, les échanges transfrontaliers et le traitement des demandes de permis de construction. Des problèmes de corruption envahissent également les entreprises russes, qui constituent en eux-mêmes un obstacle majeur à l'entrée des nouvelles compagnies sur le marché. Deuxième aspect important du pays, la fédération de Russie occupe une place unique dans la dynamique des échanges commerciaux à travers le monde, compte tenu de la concentration de son économie dans le secteur du pétrole et du gaz, mais aussi de l'influence qu'elle exerce sur les exportations des États voisins. Cette dépendance du pays à l'exportation de ressources naturelles affaiblit les PME du secteur manufacturier et des services et est à l'origine du déclin continu du nombre de biens et services non énergétiques par rapport à la part totale de ses exportations. Ceci est encore exacerbé par la perte récente

de compétitivité des entreprises russes sur le marché mondial, une caractéristique qui peut également être liée à l'importance du savoir productif dans une économie où il existe un avantage comparatif pour un espace produit caractérisé par une faible complexité, comme exploré dans notre premier chapitre. Cette forme de dépendance risque également de rendre le marché du pays très sensible au marché mondial du pétrole, ce qui peut avoir des effets particulièrement négatifs en temps de crise : les chocs sur le marché pétrolier sont diffusés dans le reste de l'économie avec des conséquences évidentes pour tous PME russes de tous les secteurs.

Figure R.4. Dynamiques des entrées et sorties d'entreprise en Russie (taux en %)



À l'aide d'un panel de données présentant l'évolution des entrées et des sorties d'entreprises dans toutes les régions russes entre 2008 et 2014, nous construisons une analyse de régression intégrant des indicateurs de l'efficacité du système judiciaire du pays et du tribunal arbitral fédéral, ainsi que des variables mesurant l'intégration des entreprises

russe dans l'économie mondiale. Plus précisément, nous estimons une équation de régression multivariée, qui prend le logarithme naturel du taux d'entrée et de sortie d'une entreprise en tant que variable dépendante ainsi qu'une approximation de la qualité institutionnelle au niveau régional et de l'intégration économique en tant que variables indépendantes, tout en contrôlant d'autres facteurs potentiellement explicatifs. Cette analyse est basée sur une base de données de panel régional riche et non publiée composée de données régionales pour la période 2008-2014. Notre analyse de régression accorde donc une attention particulière à deux aspects : les défaillances institutionnelles et les crises et ralentissements économiques récents qui caractérisent la période d'enquête. En outre des taux d'entrée ou de sortie d'une entreprise comme variable dépendante, nous nous concentrons sur deux ensembles de variables explicatives : quatre indicateurs de substitution pour l'efficacité du système judiciaire fournis par Dmitrieva et al. (2012) et le tribunal fédéral d'arbitrage, et des variables qui mesurent le degré d'intégration des entreprises russes dans l'économie mondiale : le logarithme naturel du prix mondial du pétrole, le volume total des échanges en pourcentage du PRV, l'afflux d'IED en% du PRP et enfin, le logarithme naturel de la distance entre Bruxelles et les capitales des régions russes.

Nos résultats de régression montrent à quel point les taux d'entrée et de sortie des entreprises russes reposent sur un état de droit efficace, sur la durée des demandes d'action en justice et sur le taux d'acceptation des requêtes par les tribunaux d'arbitrage régionaux. La baisse observée des taux d'entrée au cours de la période analysée et l'augmentation parallèle du nombre d'entreprises sortant du marché peuvent donc être imputées au fait que l'économie russe fonctionne dans un environnement commercial préjudiciable à la concurrence entre entreprises, tant sur le plan juridique que sur perspectives institutionnelles et politiques. Bien que ces résultats soient polarisés lorsque nous

examinons en détail les différentes régions, nous constatons un impact toujours significatif du prix mondial du pétrole sur la création d'entreprises russes dans toutes les régions, ce qui indique clairement que les prix du pétrole sont une variable clé de l'intégration des entreprises russes dans l'économie mondiale. Ces aspects sont également liés à la question de l'énergie dans un cadre plus large, et comment la dépendance de la Russie à l'égard du pétrole et du gaz naturel présente des aspects de volatilité de la création d'entreprises et d'une résilience globale affaiblie de l'économie aux chocs externes.

Tableau R.3. Résultats économétriques : Entrées et sorties des entreprises russes

Entrées d'entreprises Spécification utilisant la variable institutionnelle	Coefficient variable institutionnelle	Coefficient prix du pétrole
Durée d'une action devant un tribunal d'arbitrage régional	-0.1148 (-0.960)	0.4424 *** (14.850)
Durée d'un procès devant un tribunal d'arbitrage régional	-0.0227 (-0.120)	0.4425 *** (14.970)
Taux d'acceptation des requêtes par les tribunaux d'arbitrage régionaux (%)	-0.0184 * (-1.810)	0.4161 *** (13.360)
Registre du nombre de demandes de poursuite devant les tribunaux d'arbitrage régionaux	-0.1705 *** (-2.820)	0.4164 *** (13.610)
* p < 0.05, ** p < 0.01, *** p < 0.001		
Sorties d'entreprises Spécification utilisant la variable institutionnelle:	Coefficient variable institutionnelle	Coefficient prix du pétrole
Durée d'une action devant un tribunal d'arbitrage régional	-0.4439 ** (-2.370)	0.6838 *** (7.760)
Durée d'un procès devant un tribunal d'arbitrage régional	-0.6972 *** (-3.190)	0.6796 *** (7.790)
Taux d'acceptation des requêtes par les tribunaux d'arbitrage régionaux (%)	-0.0341 ** (-2.180)	0.7019 *** (8.090)
Registre du nombre de demandes de poursuite devant les tribunaux d'arbitrage régionaux	0.1286 (1.250)	0.7029 *** (8.190)
* p < 0.05, ** p < 0.01, *** p < 0.001		

Ces résultats nous amènent à la conclusion générale que l'économie russe fonctionne dans un environnement juridique, institutionnel et politique qui nuit à la concurrence entre entreprises, ce qui nuit par extension au développement économique. De plus, la corruption complique en outre le cadre général dans lequel les entreprises privées sont contraintes de fonctionner. En conséquence, les taux d'entrée des nouvelles entreprises

sont en baisse au cours de la période considérée, tandis que le nombre d'entreprises qui quittent le marché est en augmentation. Cela est le cas malgré des taux d'entrée déjà faibles par rapport aux autres économies en transition. Plus précisément, les taux d'entrée et de sortie des entreprises dépendent de l'efficacité du système judiciaire pour résoudre les litiges liés au non-respect des contrats et au non-paiement des arriérés. L'incertitude et l'instabilité qui en résultent, amplifiées par les pratiques bureaucratiques discrétionnaires des administrations publiques, altèrent considérablement les principes de gouvernance économique à tous les niveaux. En termes d'entrée / sortie d'entreprises, cela se traduit par une évolution chaotique des deux taux, avec des pics et des creux successifs sur la période.

Deux facteurs externes majeurs apportent des considérations supplémentaires aux conditions économiques déjà fragiles. Premièrement, les entreprises russes, principalement les PME, sont très sensibles à la variation du prix mondial du pétrole, indépendamment de leur situation géographique et de leur spécialisation. Le prix du pétrole est la seule variable liée à l'intégration de la Russie dans l'économie mondiale, qui est fortement liée à l'entrée et à la sortie des entreprises. Nos conclusions ont deux implications politiques, à savoir que les sources de pétrole peuvent être un avantage considérable si le loyer n'est pas une source de corruption généralisée et n'empêche pas le développement d'autres secteurs employant des entrepreneurs et des travailleurs ; et une règle de droit favorable à l'émergence d'un environnement commercial sain est essentielle pour permettre aux PME d'entrer / sortir du marché de manière efficace. L'économie russe, qui repose essentiellement sur des activités liées au pétrole et au gaz, n'est donc pas suffisamment diversifiée pour faire face à l'impact négatif de la chute des prix de ces ressources naturelles. De plus, il n'existe aucune perspective stratégique de développement durable dans le pays, ce qui aura certainement de graves conséquences pour l'avenir. Le deuxième facteur externe important est lié à la vulnérabilité de l'économie aux crises mondiales : bien que le degré d'intégration de

l'économie russe dans l'économie mondiale soit relativement faible, la crise de 2008 a eu un impact sur l'entrée et la sortie des entreprises du pays.

Les facteurs qui nuisent à la performance économique ont une incidence sur la création et la destruction d'entreprises aux niveaux national, régional et départemental. Plus précisément, les entrées diminuent en raison de ces éléments, tandis que les sorties augmentent, ce qui entraîne un faible taux de survie des entreprises. Cette tendance est quelque peu atténuée dans certaines régions où les gouvernements locaux sont en accord politique avec le pouvoir central, ce qui leur confère certains privilèges pour faire face aux effets néfastes des influences exogènes. Globalement, l'impact des menaces extérieures sur diverses régions varie en fonction du degré de vulnérabilité aux crises extérieures, ce qui dépend à son tour de la mesure dans laquelle une région donnée est plus ou moins isolée de la source de la crise. En conclusion, la création et la destruction d'entreprises en Russie constituent un processus multiforme, en particulier au niveau régional. En règle générale, les perspectives de croissance économique à moyen terme encouragent l'entrée de nouvelles entreprises, comme c'est le cas à l'échelle globale. En même temps, ces perspectives maintiennent en vie la majorité des organisations existantes. La forte concurrence entre entreprises limite l'entrée de nouveaux venus et expulse du marché les entreprises peu performantes. En parallèle, la forte densité de marché représente un facteur de promotion majeur pour les entrées et les sorties d'entreprises du pays.

INTRODUCTION

Over the past two centuries, the economic development of countries around the world has undergone a series of radical shifts that have re-shaped human perspectives and their relationship to development, technology and social interactions. From the start of the industrial revolution, the production and movement of capital goods has been streamlined into the creation of global economies with international markets open towards the rest of the world. In parallel, the evolution of economics as a science and the incorporation of economic knowledge into aspects of everyday life helped inform the general behaviour and interactions between agents and markets through the empirical investigation of theoretical economic concepts. At the start of the XXIst century, a new age of information streamed from the digitalisation in business, shifting the traditional industry to a new modern knowledge-based society that places data at the core of its development. These technological advancements allowed communication and services to be delivered instantaneously across the globe but also to provide individuals with a more personalised approach to their choices of consumption, simplifying the decision-making procedures for economic transactions. These historical developments have come with drastic changes in the lifestyle of individuals: not only raising their standards of living, but also offering a previously inconceivable access to an abundant range of goods and services. Today, the average citizen of a free-trade economy has access to an exhaustive range of products, available to be delivered from across the world and with minimal delays. In addition, digitalisation has also allowed the liberalisation of enterprise creation, streamlining procedures and opening access to the development of new ventures. Anyone has the potential to start and manage a self-made business with little need for physical interaction with the economic agents involved in production or distribution. In the modern world, these

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self-made enterprises have been at the source of the most revolutionising aspects of technology and human interaction, defining new ways of communication and sometimes even new economic systems in themselves.

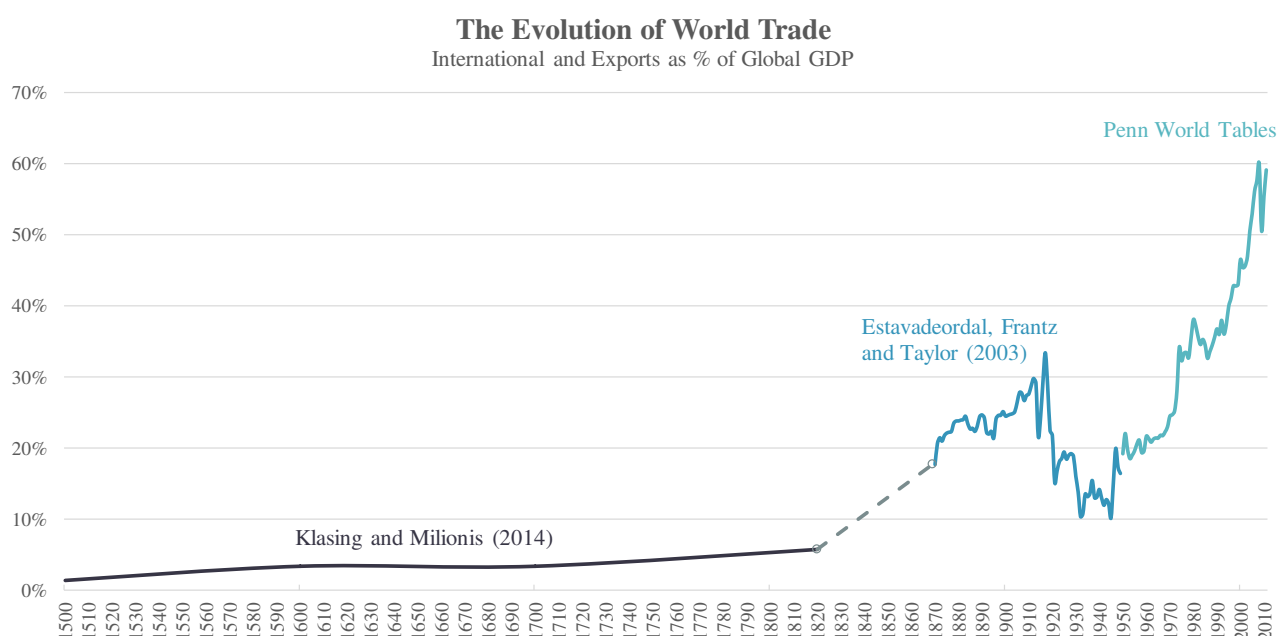
At the outset of this story lies one the most fundamental values of any economic system: the ability of nations to interact through trade. Allowing resources to travel and be exchanged across structured networks gave way to product specialisation, division of labour and the monetary system as dominant forces of economic activity. Trade networks initially evolved independently around the Mediterranean and the Silk Road route between Asia and the Middle East. Looking at the major part of history, securing trading routes has always been a cornerstone of economic and political stability. In ancient Rome, the early implementation of the *Pax Romana* to protect shipments of the Roman Republic allowed the empire to solidify their dominion as the primary maritime power of the region. Similarly, the Hanseatic League provided a defensive confederation in XIIIth century Europe to the merchant guilds and market towns of the Northern nations to protect their maritime networks from coastal raids and piracy. The power of trade has also been attested by the development of the trading republics of Venice and Genoa whose particular position at the Mediterranean node allowed them to become hegemonic centres of influence across the globe. The age of discovery brought new routes to the world and established new maritime connections between Europe and the rest of the world. The pioneering sailing expeditions of Portugal's Vasco de Gama reaching India through the circumvention of Africa widened perspectives of trade and marked the first step of what would later become known as globalisation. New and more frequently travelling routes brought the need for better interaction between trading nations and diplomatic expeditions were organised towards the outside world in order open trade with foreign countries. By the end of the

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XVIIIth century, foreign embassies were established around the world with the presence of diplomats conducting negotiations between countries over various economic and political issues. Around that time, the formalisation of economic theory emerged in the United Kingdom with the works of the classical political economists. Examining the components of trading systems, Adam Smith and David Ricardo pioneered the notion of comparative advantage, centred around the idea that trade is driven by a country's differences in natural resources and technological development. Under these assumptions, all nations engaged in free market trading would benefit from the exchange with each country increasing its consumption by exporting goods for which it has a comparative advantage and importing the other ones. The theory of international trade became the source of governmental policies in the early industrialisation of western Europe, with countries pushing to industrialise in order to compete with the English market. Coupled with the scientific and technological advancements of the time, trade liberalisation expanded worldwide networks and set off the rise of global business structures integrated in the developing world economy that would become the international markets of today. At the start of the XXth century, the Great Recession brought a prolonged period of stagnation, followed by a large decrease in trading activity, considered by many economists as having worsened the effects of the recession, particularly for countries dependant on foreign flows. These adverse economic consequences were reverted at end of the second world war, when the rapid increase of the population created an ever-growing demand for commodities, developing the standardised production of goods through economies of scale and further expanding the interconnectedness of the world's economies. In this context, trade clusters around the world became more integrated to facilitate these processes in an attempt to increase cooperation and associated benefits. This phenomenon is known as regional integration: through common institutions and rules, states enter into mutual agreements in order to achieve

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broader social and economic goals. In general, these involve the liberalisation trade and encouraging the free movement of labour and goods but also measures to reduce the risk of regional armed conflict. Examples include the European Union, The North American Free Trade Agreement (NAFTA) across the United States, Canada and Mexico and the Association of Southeast Asian Nations (ASEAN) which incorporates the South-East Asian countries. To a lesser extent, a form of regional integration also occurs at the national level when large states such as the United States, China or Russia conduct domestic policies in an attempt to provide better integration of larger areas.



The chart above presents the evolution of World Trade since the age of discovery, showing World Exports as % of Global GDP, drawn from the works of Klasing and Milionis (2014), Estavadeordal, Frantz and Taylor (2003) and the Penn World Tables. From the end of the middle ages, international trade followed an exponential growth path, reaching more than half of the World GDP at the start of the XXIst century.

The academic study of the inception and evolution of areas of political and economic integration has taken a variety of dimensions to examine the various impact and achievements of the associated nations. Our analysis lies at the cornerstone of what we believe are the major components of efficient regional integration. In this paper, we

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investigate a nation's ability to integrate efficiently in a larger economic area by assessing the ability of its economic agents to accumulate and develop productive knowledge, the efficiency of its diplomatic network and the ease of entering the market and setting up a business within the country. Our examination takes a multi-dimensional approach to these characteristics by looking at three distinct geographical areas where regional integration takes place.

We begin our study with a new evaluation of the benefits of membership to the European Union, the area which constitutes the highest form of economic integration that has taken place between any group of nations in the world. Within its internal market of 28 states, EU policies ensure the free movement of labour, goods and capital as well as providing common legal and regulatory environment steering common rules on trade and economic development. The EU is also home to a unique common currency within the Eurozone and the free travel Schengen area, where passport control has been removed. Membership to the EU is open to any European state and its enlargement has been a major component of its political landscape. Overall, the process of integration aims to assist new joiners in transitioning to democratic, free-market liberal economies. This is achieved through mutual regulations that promote the rule of law and human as well as freedom of trade and the development of a common currency market. In 2004, the first group of countries from the former Eastern Bloc and Yugoslavia entered the European Union, comprising the Baltic states (Lithuania, Latvia and Estonia), Poland, Czech Republic, Slovakia, Slovenia and Hungary. Three years later, in 2007, two other new countries from that area (Bulgaria and Romania) became EU members. The Eastern Enlargement is the largest to date and marks a symbolic unification of the European community in the aftermath of the Cold War, where former countries of the Eastern Bloc moved towards a consolidating their democracy. The study of the integration of those countries has taken a

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wide space in the academic research with various studies focusing on the impacts and benefits of integration on the new members. Part of these will be assessed in our literature review in that chapter to provide a better context of the established results. To a large extent, the initial economic objectives of integration have been largely achieved with significant development observed in the socio-economic indicators of the new member states, including GDP per capita, private consumption, inflation stability, foreign investment, employment and wage rates. Similarly, trade developed significantly with exponential increases in export volume in all the new countries. In the latter dimension, studies have primarily focused on the overall evolution of the volume of trade within and between the countries. Our paper provides a new perspective by undergoing an assessment of the actual components of the trade flows, looking at how the complexity of what the new member countries have produced and exported has evolved since their accession. In this way, we are able to assess whether EU membership has actual benefits on a country's productive knowledge and its capacity of transitioning from relatively low complexity of exports (such as clothing items, primary resources) to an economy that houses deeply integrated knowledge of high end production. The challenges of analysing such a large data space comes with the need of distilling the essential information of what is considered as an economically complex space of production. In order to achieve this, our analysis explores the use of a prominent tool of research in recent years, the Economic Complexity Index (ECI) which aims at providing a new approach to quantify a country's level of industrial development. Developed jointly by Cesar A. Hidalgo, from the MIT Media Lab and Ricardo Hausmann, from Harvard University's Kennedy School of Government, the index has gained significant traction avec the last years in its attempt to provide new understandings of the less tangible aspects of economic development. In the context of our study, we will use the Economic Complexity Index of the new member states as a basis for

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our assessment of the impact of their EU accession. By combining the ECI with a methodology of synthetic control, our first chapter tests the significance of each country's evolution through the comparison of a generated counter-factual. In other words, we are attempting to answer the question: "Are the members of the Eastern European Enlargement exporting products of a higher complexity today than they would have done had they not accessed the EU?" The study provides individual results for each country as well as an overall test of average treatment effects over the whole group and robustness tests.

Overall, we find that our control models predict that EU accession had the most significant benefits on the export complexity of countries with initially low levels before their accession. These effects are substantial for the Baltic States (Estonia, Latvia and Lithuania) as well as Romania and Hungary. The benefits were lower for countries with high initial levels of export product complexity (Czech Republic, Poland, Slovenia and Slovakia) and inexistent for Bulgaria, the only country of the group that has initially low levels that how show no concrete evolution in its export product space from its accession to the EU.

Our second chapter extends our analysis of regional integration by broadening the scope of our evaluation to include the impact of hard and soft infrastructure on international trade. Having explored the influence of European enlargement on the composition of new members' export space, we proceed to examine how integration operates at a larger geographic scale by including all European Union countries as well as North African states. Particularly for the latter group, integration constitutes a central aspect of economic study as most of the countries remain relatively isolated between each other and towards the rest of the world. The creation of the Arab Maghreb Union in 1989 provided a promising perspective for the nations of Algeria, Libya, Mauritania, Morocco and Tunisia to enter into a mutual agreement towards improved economic and political stability. However, as

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reported by the United Nations Economic Commission for Africa (UNECA), the Union has been unable to achieve tangible results in developing the trade potential and political relationships within the area. The North African market remains among the least dynamic in the continent, with poor trade facilitation and persistent barrier. Nevertheless, with a significant access to the sea, a large population and emerging transport infrastructures, the region has the potential of developing into a significant trading node. In this context, the integration process becomes a key characteristic for the sustained growth of the region and to allow for a greater stability and overall resilience to external shocks. For the Central and Eastern European countries, the collapse of the Soviet Union has brought a new era of trade liberalisation towards the western part of the continent characterised by substantial reduction in tariffs and other trade barriers. Western nations have taken a big part in entering the Eastern market but also in integrating the countries within their own economies, paving the way for the development of large-scale infrastructure projects that served to restructure trade within the continent. Furthermore, the end of the cold war thawed the diplomatic relationships between the two political blocks, allowing for the development of a previously limited network of embassies between the European nations. In this context, we consider trade infrastructure as a key aspect of study within these regions in order to understand the evolution of the dynamics of trade in the European and Mediterranean area. These elements become particularly important in the background of the large shifts in trade orientation that occurred at the end of the XXth century within the region and also in understanding how these networks are set to evolve in the coming decades. Traditionally, most studies in the literature consider trade tariffs as the main determinant of the lack of integration. Our goal is to extend on these findings to incorporate “soft” infrastructure elements relating to the diplomatic relationships between two trading countries. As such, we treat the presence of diplomats as a major component of trade

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facilitation and a key political investment for the inclusion of an economy into a connected trade network. Our analysis takes a targeted comparative approach for the two geographical areas in an attempt to reflect regions with defined political and judiciary environments and focusing on the nations composing these areas and their main trading partners. The sample includes European countries that have a vocation to integrate the EU and North African countries that are part of the near European neighbourhood. Our methodology is based on the extended gravity model developed by Hanousek and Kočenda (2014) that includes the traditional control variables of population-weighted distance, common language, border and legal system. The model employs Trade Facilitation Indicators measuring the direct monetary cost and fees associated with the export and import of traded goods as well as other friction elements linked to the action of trading abroad. To these indicators, we add diplomatic variables to measure the impact of bilateral representation through the appointment of an official from another country to promote and defend national interests.

The results of our gravity model suggest that reducing the quality of the logistics, infrastructures and services related to trading activities, including associated fees, the number of legal documents, and the average shipment times would fill the gap between the average bilateral fixed effect of North Africa and of the CEECs, with a significantly higher impact for the latter. In addition, diplomatic presence has a significant role towards the improvement of trade logistics in these countries which confirms our intuition that soft and hard infrastructure have a combined impact of the dynamics of international trade.

In our third and final chapter, we proceed to analyse a complementary economic aspect of that also lies at the core of trade dynamics: the creation of new firms. It is generally perceived that the development of SMEs is key for the emergence of values and norms attached to the market economy. For the scope of this research, we chose to focus on the Russian federation, which provides an important perspective on what composes the

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determinants of firm entry and exit within the country. This choice allows us to provide a perspective of business creation at a national level in order to understand how country wide policies can affect a large geographic area such as the one occupied by Russia. Overall, the country is characterised by very low levels of firm entry by international standards, even though the country performs relatively well in terms of formal constraints. However, a weak rule of law is harmful for the sound development of Russian firms as attested by the low desire to invest at home and a general environment of uncertainty and inconsistency in the enforcement of existing policies. Business issues are reflected by the poor protection of minority investors, trading across borders, and dealing with construction permits items. Problems of bribing and corruption are also pervading Russian businesses which in themselves form a major and self-reinforcing barrier to entry. A second important aspect of the country, the Russian federation takes a unique place in the dynamics of trade across the world, given the concentration of its economy in the oil and gas sector, but also the influence it exerts on the export space of neighbouring states, as is further developed in the results of our first chapter. This dependence of the country on the export of natural resources weakens SMEs in the manufacturing and services sector and lies at the source of the continuous decline in the number of non-energy goods and services relative to the total share of the country's exports. This is further exacerbated by the recent loss of competitiveness of these Russian firms in the global market, a feature that can also be tied to the importance of productive knowledge in an economy where a comparative advantage exists for a product space characterised by low levels of complexity, as explored at the start of this paper. This form of dependence also has the potential to make the country's market highly sensitive to the world market for oil which can have particularly negative effects in time of crisis: shocks in the oil market are diffused to the rest of the economy with obvious consequences for all Russian SMEs across all sectors. Within this context, we propose to

Introduction

analyse the determinants of firm entry and exist in the Russian federation through a regression analysis that focuses on the two aspects mentioned above: the failure of institutions to support and maintain business development and the recent politico-economic crises. Our dataset of Russian firms is drawn from the Federal State Statistics Service (Rosstat) which discloses yearly rates of firm entry and exit between 2008–2014 and all over the Russian Federation, for federal districts and constituent entities. To assess the impact of institutional failures on the creation and destruction of Russian firms, we employ four proxies for the efficiency of the judiciary system, including the duration of lawsuit at a regional arbitration court, the acceptance rate of petition by regional arbitration courts, and lawsuits application number to regional arbitration courts. In addition, we also include a criminal risk ranking as an additional proxy for the institutional quality. All of the variables used in the regression are available at the regional level, allowing us to look at each region separately and assess the effects based on their composition, and the implied dependence on the export of oil and natural gas.

Our results find that the above institutional elements exhibit statistically significant and economically meaningful effects both on the creation and destruction of Russian firms and that the process of firm entry and exit is manifold across Russian regions due to their heterogeneity. Nevertheless, a robust estimate of the world oil price (irrespective of the difference in target regions) also suggests a possible high exposure of each Russian region to a global crisis. This comes from the importance of oil trade with the world and, accordingly, the ongoing crisis may bring a harmful influence on the regeneration of Russian businesses.

Introduction

The paper is structured in the form of the chapters presented above, each containing an introduction to the subject of study, a literature review of the previous academic works related to the topic as well as a description of the methodology used. Our final part concludes, tying the different studied aspects of regional integration into a closing narrative with our final thoughts on the result of our studies and their implications for informing governmental policies.

CHAPTER I.

A SYNTHETIC CONTROL EVALUATION OF ECONOMIC COMPLEXITY IN THE NEW EU MEMBER STATES¹

INTRODUCTION

International Trade theory has been one of the cornerstones of economic analysis in the modern era of globalisation that developed at the turn of the XXIst century. Starting from the concepts laid by Adam Smith and David Ricardo, classical trade theory focused on the notion of comparative advantage which stipulates that trade is driven by countries' differences in natural resources and technological development. From these classical foundations, modern trade theory or "New Trade Theory" evolved by incorporating microeconomic elements to focus on the more detailed aspects of trade components, acknowledging that dynamics of trade need to be examined closely in order to allow for a deeper understanding of the underlying complexity. Following this school of thought, the development of economic complexity by Hausmann et al. (2007) is a strong candidate for the next step in the analysis of international trade dynamics. By looking at the complexity of the products manufactured and exported by a certain country, valuable insights can be gained of a country's economy and as well as the dynamics of the larger market it shares with its neighbours. In the following line of research, this paper will extend the current analysis of economic complexity by tying its evaluation to the process of economic integration. Economic unions are particularly important to study as the effects of integration

¹ Co-authored with Bruno Castanho Silva

have widespread effects on trade dynamics and competitiveness. In this respect, the European Union (EU) has been of the core area of study of trade dynamics due to its unique nature in being the highest form of economic integration that has taken place between any group of nations. The EU encompasses a range of liberalization policies affecting service trade, foreign investment, tariff barriers and guaranteeing the free movement of people and intellectual property. The EU is also home to a unique common currency within the Eurozone, shared between its members and the one of the most tangible aspect of the European integration. In 2004, the first group of countries from the former socialist block entered the European Union: the Baltic states (Lithuania, Latvia and Estonia), Poland, Czech Republic, Slovakia, Slovenia and Hungary. Three years later, in 2007, two other new countries from that area (Bulgaria and Romania) became EU members. The European Union opened the doors to the Central and Eastern part of the continent with the declared goal to reintegrate those countries in the European family, which would help them to consolidate their democracy. Economically, the goals of EU membership can be summarised as having two major dimensions. On one hand, European regulations are aimed at raising the standards of living of joining members and to a large extent, these objectives have been largely achieved. Nine years after integration, the GDP per capita positively increased in the new member states along with most of the other socio-economic indicators (including private consumption, inflation, investment, employment, wage rates, etc.)

The second aspect of European membership aims at boosting competitiveness by incentivising an open market through trade freedom and the access of a common currency market. Focusing on the latter dimension, this paper takes a new path in analysing the impact of integration on competitiveness by examining the complexity of the product space exported by new member countries. The volume of exports and trade developed over the first nine years of EU membership period in all the new countries, the highest such increase

being recorded in case of the three Baltic states. While this increase provides part of an answer in the deployment of trade in the enlarged European market, our study takes a deeper dive into the key components of trade and their associated complexity. A prominent tool of research in recent years, the use of Economic Complexity aims at providing a new approach to quantify a country's level of industrial development. Economic Complexity analyses the sophistication of products that a certain country exports and has been found to be strongly linked and a robust predictor of economic development. In order to assess the evolution of qualitative transformations since the accession to EU of all former socialist countries, we propose to analyse how the levels of Economic Complexity of the more recent joining countries have evolved since their accession by testing the significance of its evolution through the comparison of a synthetic counterfactual. The latter represents a simulated path of development of a certain country under the assumption that it had not joined the European Union and is determined by a set of defined predictors.

The paper is structured as follows. In our first part, we will draw out a literature review which examines recent research structured on the economic impacts of European integration along with the applications of synthetic control methods in the field of macroeconomics. In a second part, we will present the data and a description of the methodology employed in our analysis. The third part will be the analysis of individual results for each country and how our synthetic model holds in testing the economic benefits of European integration. The analysis will also include several robustness tests to validate our results. The final part concludes.

LITERATURE REVIEW

Integration though Economic Union

A large number of studies have dealt with the impact of EU enlargement towards Eastern Europe. Prior to the first wave of integration, most of these studies predicted an overall positive outcome in economic terms. In more prudent opinions, like Bchir, Fontagné and Zanghieri (2003) for example, the enlargement raises several concerns related to the huge disparities between accession countries and existing member states in terms of per capita income, which would lead to massive immigration and/or relocation of labour-intensive industries. Concerns are also raised by Weisse et al. (2001) with respect to social and economic cohesion (expressed in GDP per capita and unemployment rate) after integration.

After the first wave of enlargement, the number of evaluation studies has increased significantly. An official evaluation carried out by the European Commission (2006) concludes that the EU integration of Central and Eastern European countries has brought stronger economic growth, which accelerated the process of economic convergence between old and new member states (EURACTIV, 2010). In 2009, an extensive analysis by the Trans European Policy Studies Association (2009) examines the specific questions of the effects of EU enlargement. The study takes various dimensions and finds positive impacts of EU accession for New Member States in terms of economic integration with a higher rates of economic growth, employment as well as a continued development of trade and an overall convergence towards Old Member levels. The study notes that some of the adjustments associated with EU membership began already when they applied for membership, or even before. Similarly, Efstathiou (2011) estimated econometrically the impact on economic growth of the new member states and concludes that the integration

process had a positive contribution to the GDP growth via the FDI inflows. The study also demonstrates that the enlargement is beneficial for the old members, in terms of economic growth, which is stimulated by their trade augmentation. Havlik (2013), assesses the impact of structural changes on aggregate economic growth that occurred in European economies during the past two decades, focusing on the new EU Member States of Central and Eastern Europe by using a conventional shift and share analysis in order to evaluate the impact of broader sectoral shifts on GDP growth. The study finds that the previous NMS-OMS divisions are becoming less relevant with broad shifts from agriculture and industry towards services in new members.

Apart from the positive economic impact, the democracy has been consolidated in these countries (Sedelmaier, 2014), which brought peace and stability on the continent (Avery et al, 2009). Individual country evaluations have also been carried out with diverse studies focusing on a range of elements to integrations. Belka (2013) concludes that Poland accession led to relatively fast and steady economic growth, which induced a significant increase in the standard of living. In case of Czech Republic, the EU membership has brought a significant increase of its trade and played important roles in several fields such as the internal market and energy, for example (Dostal, 2014). Latvia has benefited from an annual increase of per capita income estimated at US\$ 3218 until 2010 (Martinovic, 2015). Slovakia's first decade as an EU member state was marked by robust growth and relative economic resilience (Nic et al, 2014). The special case of the Baltic states is thoroughly analysed by Grigas, Kasekamp, Maslauskaitė and Zorgenfrei (2013) who exposes the particular historical path these states have followed in joining the EU and provides with perspectives on why the global 2008 crisis had such a significant on the group, given its structural macroeconomic balances. A significant dimension of study for the Baltic states is the Energy Dependency on Russia and how the countries are paving the

way for more liberalisation and investment and diversification of sources towards renewables and other alternatives.

Economic Complexity

As described in our introduction, recent research has begun to provide an alternative approach to more traditional conceptualizations of the economic growth process by demonstrating the value, difficulties and challenges that emerge from both, the process of economic self-discovery (Hausmann and Rodrik, 2003) and the structure of economic diversity (Hidalgo and Hausmann, 2009). Contrary to factor-based models of growth, these works assume that the production of a good results from the local convergence of a large number of non-tradable inputs, or capabilities (Hidalgo and Hausmann, 2009). A prominent index in recent literature, economic complexity has been developed in an attempt to provide with a holistic measure of production characteristics of large economic systems. The Economic Complexity Index (ECI), connects countries to the products they export by combining information on the diversity of a country's export and their relative sophistication. Countries with high indices of complexity typically export a wide range of products (high diversity) that are not commonly produced by many countries (low ubiquity). A more formal methodology of how economic complexity is calculated is presented in our appendix at the end of this paper.

The use of economic complexity in the economic space remains a relatively new implement although the individual results present a strong argument for its use in the fields of economics. One of the first papers presenting the methodology and use of economic complexity by Cesar A. Hidalgo and Ricardo Hausmann (2009) has paved the way in the development of the index as a way to quantify the complexity of a country's economy. By characterizing the structure of a country's exports, the authors demonstrate how some of the individual activities that arise from the division of labour (such as property rights,

regulation and infrastructure) cannot be imported and so countries need to have them locally available to produce. The authors proceed to compare how measures of complexity are correlated with a country's GDP per capita, and how deviations from this relationship are predictive of future GDP growth. This suggests that countries tend to approach levels of income that correspond to the measured complexity of their productive structures. The evolution of a country's productive structure has been further analysed by Hidalgo (2009) who study the dynamics of the level of sophistication of countries and of products over a period of 42 years. The author identifies countries that contributed the most to the increase of the ranking substantially during this period, notably Korea and Singapore who also saw their economy grow significantly during the period of study. These results have been further confirmed by the works of Ozguzer and Binatlh (2015) who test the evidence that complexity is a good predictor of economic growth in the context of EU countries. Using GMM regressions between growth and complexity, the authors find that countries whose economic complexity exceeding a certain threshold tends to present a faster convergence to the levels of income corresponding to their measured complexity. Such results are analysed in more detail by Gabrielczak and Tomasz Serwach (2017) who use Slovakia as a case study to the impact of the euro adoption on the complexity of exports goods. The authors apply the Synthetic Control Method to compare levels of export complexity in Slovenia before and after the adoption of the euro with the counterfactual scenario of Slovenia not entering the Eurozone. Their results indicate that accession to the European Monetary Union (EMU) led to an increase in the complexity of exported goods. The increase however remained relatively small and seemed to have only a temporary effect. The determinant of complexity itself remains a disputed debate with various mechanisms proposed to explain its composition. Foreign direct investment is commonly cited as a source of higher export complexity. A study by Harding and Javorcik, B. (2012) using a

sample covering 105 countries from 1984 to 2000 relates unit values of product exports to data on sectors treated by investment promotion agencies. Results find a positive effect of FDI on exports for developing countries along with ambiguous results for higher income groups. Similarly, Eck and Hubert (2016) demonstrate how FDI inflows sped up growth in India through supplier linkages by facilitating the manufacturing of more sophisticated products by local firms. Institution development represents a second key aspect in the stimulation of a country's economic complexity and according to the models by Costinot (2009), more complex goods are produced in countries with a higher institutional quality: better institutions and educated workers are the sources of complex industries. Closely linked to this aspect, the author also demonstrates how having an environment for entrepreneurship enables the successful implementation of more complicated production processes in the economy. These competences can be further improved through educational and R&D policies, which are also important prerequisites for developing sophisticated goods and services as demonstrated by the work of (Anand et al., 2012) who present how sophisticated sectors are more likely to act as a catalyst for the sophistication of manufactured and service exports. Finally, Economic Complexity has also been studied in the context of income inequality by Hartmann, Jara-Figueroa, Guevara, Simoes and Hidalgo (2017) who did a comparative analysis of the productive structure of countries in Latin America and the Caribbean with that of China and other High-Performing Asian Economies. Their findings conclude that Asian countries have managed to diversify into products typically produced by countries with low levels of income inequality, while Latin American economies have remained dependent on products related to high levels of income inequality. The authors determine the need of the latter to match the social policies with industrial policies that facilitate higher levels of economic complexity based on opportunity-based entrepreneurship and innovation systems in order to overcome these

structural constraints of inclusive growth.

Synthetic Control

The analysis in this paper makes use of the synthetic control methodology which was pioneered and developed by the works of Abadie and Gardeazabal (2003) to conduct causal inference of an individual unit of study in the presence of the structural transformation. Their specific case examined the economic effects of conflict (terrorism) in the Basque country and determined that GDP per capita in the region declined by 10% relative to its synthetic counterfactual: a control region without terrorism. The use of synthetic control has gained a widespread traction across a number of disciplines, ranging from health economics to criminology and politics. Particularly for public policy, synthetic control is a powerful tool to evaluate the effects of a particular treatment. A major piece in this field has been the evaluation of California's Tobacco Program using the method (Abadie, Diamond, and Hainmueller, 2010) which estimated that by the year 2000, annual per-capita cigarette sales in California were about 26 packs lower than what they would have been in the absence of a control program. In the case of health-related policies, synthetic control has been used in the context of an evaluation of the P4P scheme (Kreif et al, 2016), concluding that the program did not improve health outcomes for conditions incentivised. The results contrasted with a parallel Difference in Difference estimation of the same outcomes, with the difference that the latter method does not allow for the effects of an intervention to change over time. The methodology has also gained some traction in the field of macroeconomics, core to our own study, with studies assessing the impacts of significant structural events across groups of countries. A core research paper in the field has been the works of Abadie, Diamond, and Hainmueller (2015) which sought to test the economic impact of German reunification in West Germany. Through a selection of a pool OECD countries, the authors constructed a synthetic control to West Germany prior to

1989, along with a trajectory in GDP per capita that tracked that of West Germany up to 1989. The weighted average of countries gave the highest weights to Austria, the US, and Japan, to produce the synthetic West Germany. The authors observed that West German GDP per capita starts falling behind that of its synthetic control after 1989, lending evidence to the hypothesis that the reunification had a negative economic impact in that part of the country. In another context of change in macroeconomic structure, Nannicini and Billmeier (2011) investigate the impact of economic liberalization on real GDP per capita in a worldwide sample of countries by examine the effects of synthetic counterfactuals on an index of liberalisation, driven by trade tariffs, barriers and the extent of government control. The study finds a positive effect of liberalisation on income per capita for the majority of countries with the notable exception of a number of African countries which did not benefit from these trade reforms compared to similar, but closed economies. In the context of European integration, synthetic counterfactuals have been applied by Campos, Coricelli and Moretti (2014), which estimate the benefits of integration in terms of economic growth and conclude that new member states gained up to 12% in per capita income terms from the process. This paper presents an extension to these results by focusing specifically on new joining members in Eastern and Central Europe and looking at aspects of trade competition benefited from integration through the lens of the complexity of their export product space.

In the context of these findings, our paper will provide a new perspective by introducing a synthetic control evaluation of economic complexity for the newest joining countries of the European Union. The details of our evaluation are presented below.

DATA AND METHODOLOGY

The synthetic control method (Abadie and Gardeazabal, 2003) allows us to conduct causal inference for a single case or unit, on a variable that has been observed over time, in the presence of a structural transformation. It works by using a “donor pool” of comparable units which have not gone through the same structural transformation to create a counterfactual, the *synthetic control*, i.e., a weighted average of the comparable units. This synthetic control is created so that it reproduces as closely as possible the behaviour of our treated unit on the outcome of interest and a host of relevant covariates *before* the structural transformation took place. If we find a synthetic unit that, before the transformational event, is very similar to the real one, we should expect that the two would continue to be similar after said event, if it had no impact. Thinking in terms of the potential outcome’s framework (Imbens and Rubin 2015), this synthetic control is our best possible estimate of what the potential outcome of the treated unit would have been under no treatment.

In our case, the synthetic control method estimates the effects on economic complexity of European Union membership by comparing the evolution of economic complexity, our dependent variable, for a new member country relative to its synthetic counterpart which did not become an EU member. More formally, the method attempts to answer the question: “What would have happened to the economic complexity of a new member state had it not joined the EU?”

The bellow explanation follows the formal methodology established by Abadie & Gardeazabal, (2003) and Abadie et al., (2010, 2014):

We wish to examine the effects of an intervention (in our case, joining the EU) which happens at treatment time $t=T_0$ (the year of accession of each country). Naturally, we expect and assume that for $t < T_0$ the intervention has no effect on the unit of study.

A synthetic control evaluation of economic complexity in the new EU member states

For a certain treated unit i at a certain time $t > T_0$ we denote the average treatment effects α_{it} of an intervention as:

$$\alpha_{it} = y_{it}^1 - y_{it}^0 \quad \text{for } t > T_0 \quad (1)$$

where:

- y_{it}^1 is the outcome of the dependent variable which received the intervention at time T_0
- y_{it}^0 is the outcome of the dependent variable had it not been subjected to the treatment

As we know that a treated unit has indeed received the treatment by definition, we will not be able to readily observe y_{it}^0 . To solve this fundamental problem of causal inference, the Synthetic Control Method overcomes the issue by creating synthetic values of y_{it}^0 from a donor pool of J units which have the characteristic of not having been treated during the whole period of study.

The method proposed by Abadie and Gardeazabal (2003) provides a proxy of y_{it}^0 as a set of weights assigned to all units in the donor pool so that:

$$y_{it}^0 = \sum_{j=0}^J w_j y_{jt}^0 \quad \text{for } t > T_0 \quad (2)$$

where:

- w_j is the assigned weight of country j with $0 \leq w_j \leq 1$ and $\sum_{j=0}^J w_j = 1$
- y_{jt}^0 is the value of the independent variable for country j (not subjected to treatment)

The weights are obtained through an optimisation algorithm using Mean Squared Prediction Error (MSPE) calculated on the pre-treatment period ($t < T_0$) that selects weights

for each unit in the donor pool in order to minimise two quantities:

- the MSPE on the pre-treatment period of the dependent variable
- a measure of distance between the treated unit and the synthetic control on a number of independent variables that are theoretically considered to affect the outcome.

The optimisation problem can be summarised as below:

For the optimal choice of weights W^* we define:

- X_I the $K \times 1$ vector of variables that predict the pre-treatment behaviour of the dependent variable y for the treated unit
- X_0 a $J \times K$ matrix containing the pre-treatment values for these predictive variables in all J control countries
- V the $K \times K$ matrix measuring the relative importance of the pre-treatment independent variables

The vector W^* is chosen to get as close as possible to $X_I = X_0 W$, solving the minimisation problem:

$$\min(X_I - X_0 W)'V(X_I - X_0 W) \text{ s.t. } 0 \leq w_j \leq 1 \text{ and } \sum_{j=0}^J w_j = 1 \quad (3)$$

This optimisation effectively assigns larger weights for pre-treatment variables with larger predictive power. The *Synth* package in R uses an optimization algorithm to find values for W that minimize the MSPE. Analyses are performed with the packages *Synth* (Abadie, Diamond, and Hainmueller 2011), and *SCtools* (Castanho Silva 2016) for R.

Applying the methodology to our case, we want to test whether entering the European Union has had an impact on the economic complexity of the ten Central and Eastern European countries that joined in 2004 and 2007. Our treated group of countries is

composed of all the new members from the second and third waves of integration: Bulgaria, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Romania, Slovakia and Slovenia. For our donor pool, we select a group of countries that have not joined a common market similar to the European Union². From this pool, we determine each country's synthetic control by finding the optimal vector of weight W^* , that best reproduces the characteristics of that country and its economic complexity prior to EU accession. A short description of the data is presented below.

² We use a reduced version of intermediary donor pool from Bower and Turrini (2010) which contains the following non-EU countries: Argentina, Australia, Belarus, Brazil, Chile, China, Colombia, Croatia, Egypt, Hong Kong, Israel, Japan, Korea, Macedonia, Malaysia, Mexico, Morocco, New Zealand, Philippines, Russia, Switzerland, Thailand, Tunisia, Turkey, Ukraine, Uruguay

DESCRIPTION OF VARIABLES

Economic Complexity

In this section, we present a short description of the variables used in our analysis with a focus on the Economic Complexity index. As a preliminary exposition, we look at the distribution of the ECI across all countries in our database (including both treated and donor pools). In 2015, the median ECI across the group was 0.63, the country with the highest ECI being Japan (2.59) and the lowest Australia (-0.77, which also recorded the biggest drop over the period of study along with New Zealand).

By looking at the index split in different income groups, we are able intuitively visualise the facts presented in the literature: countries pertaining to higher income groups have a higher complexity than the ones in upper and Lower Middle-Income groups. Looking at the median for all groups, Economic Complexity has increased overall over the 1995-2015 period, with a notable increase in the variance for the Upper Middle-Income group. By running a linear regression for the three groups, we can also visualise how coefficients of our slopes are reducing as we go into higher levels of income, an indication of the existence of a plateau of complexity countries can achieve, and a potential convergence effect.

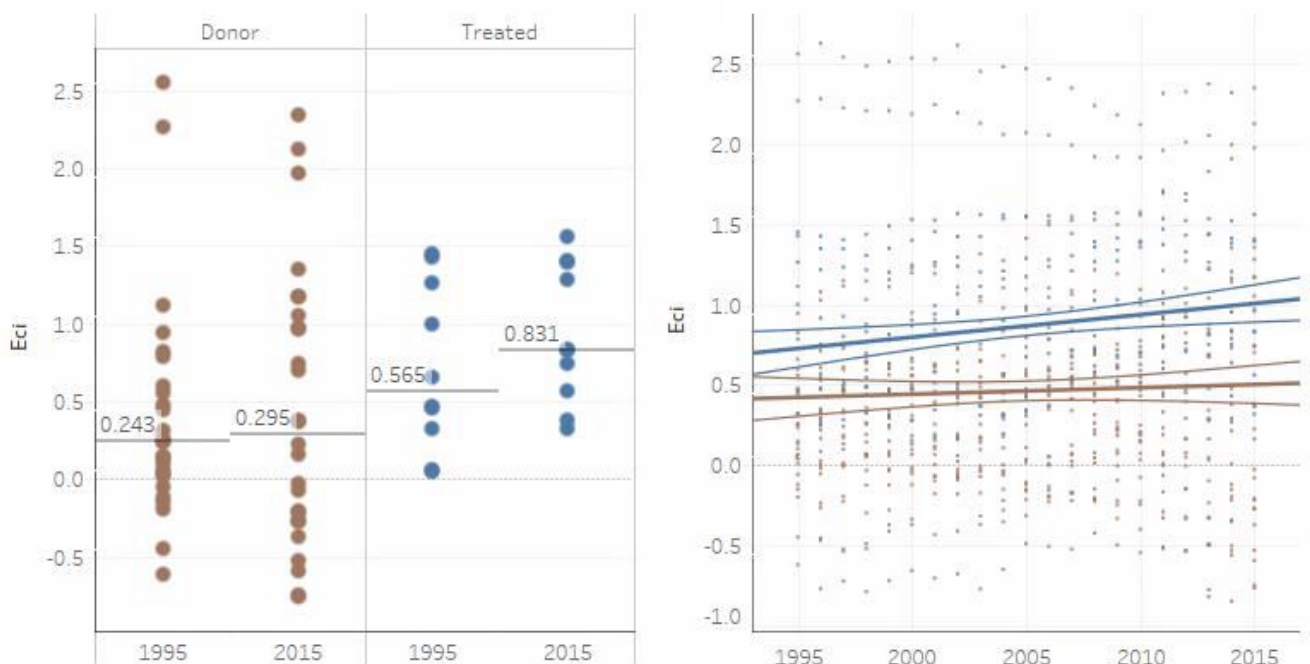
Looking at the split between our treated and donor group, we notice that there is a higher variance in the distribution of ECI for the former, in itself a good indication that the chosen group of countries is fit for our analysis as it is not clustered into a group with similar characteristics. The treated pool of countries has increased its levels of economic complexity over the period of study with median values increasing from 0.57 in 1995 to 0.83 in 2015. In addition, the regression lines run through the two groups offer a greater

clarity over this evolution with a positive growth displayed in the case of the treated group against a relatively flat line for the group of donor countries.

Figure 1.1 Economic Complexity Index – By Income Group

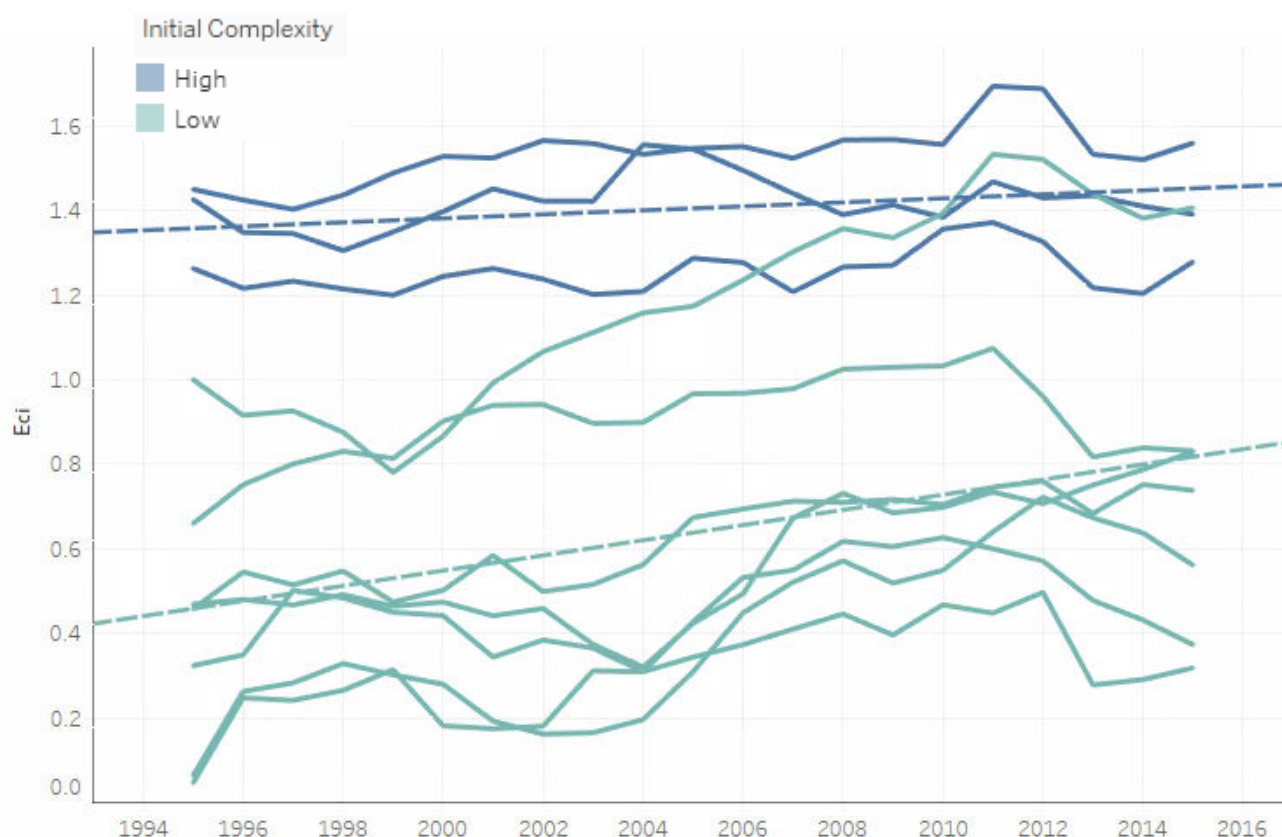


Figure 1.2 Economic Complexity Index – Treated vs Donor



At the individual country level for the donor pool, we note that there exist two distinct groups in terms of complexity: three countries with high levels of complexity at the beginning of the period of study (Czech Republic, Slovakia, Slovenia which all start at ECI levels > 1) and seven countries with lower levels of complexity (Bulgaria, Latvia, Lithuania, Estonia, Romania and Poland with ECI levels < 1 in 1995). Looking at the evolution of the two groups separately (as presented by the linear regressions below), it becomes apparent that the group with higher initial levels records a slower rate of growth in complexity over time than the one with lower initial levels. This observation seems to point once more at a converging effect of complexity over time and relates to economic complexity being an indicator of the income group of a specific country (with the top three countries being in the high-income group).

Figure 1.3 Economic Complexity Index – Evolution in the Treated pool

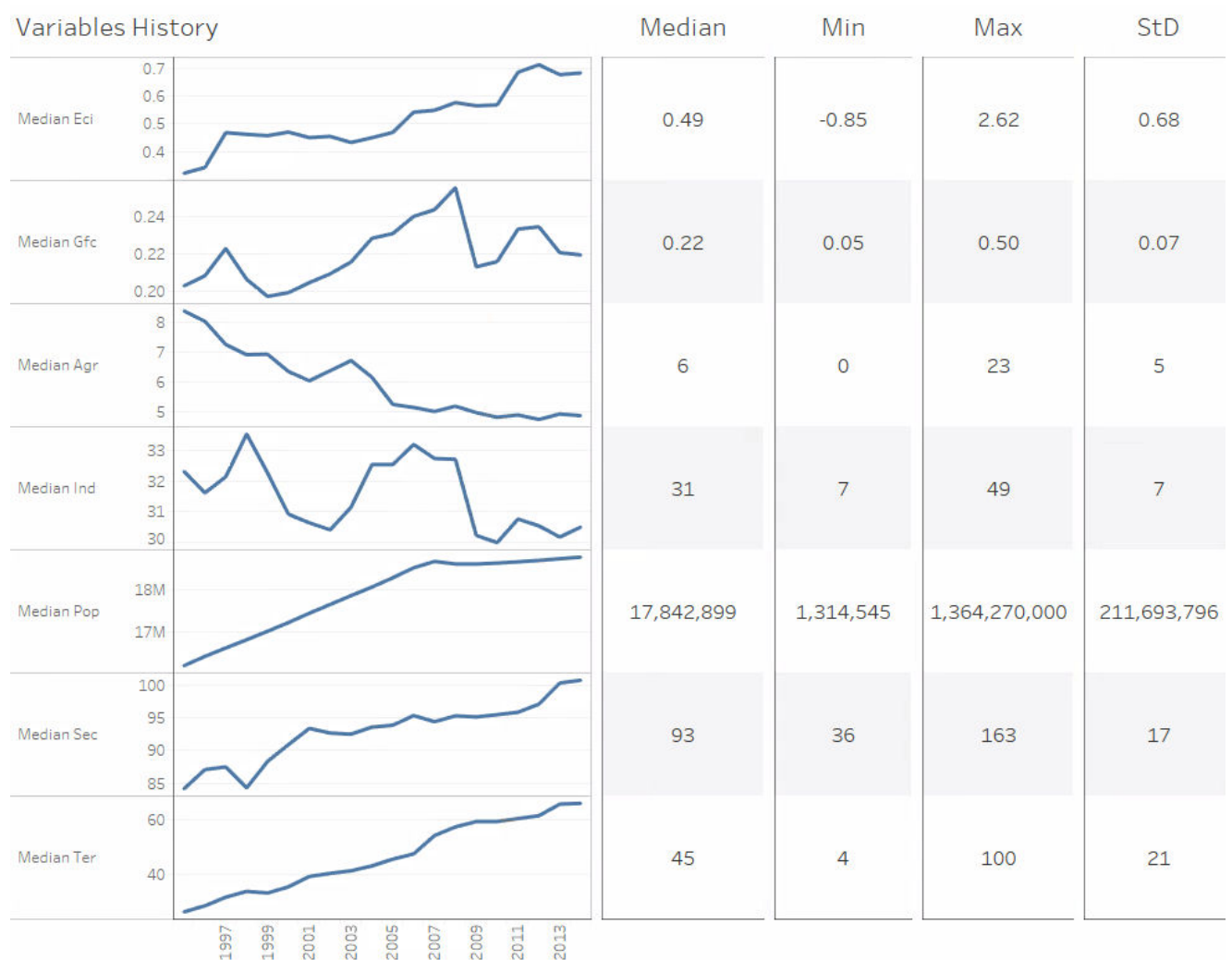


Predictor Variables

In this section below, we present the variables that we chose in our optimisation algorithm to construct the synthetic country counterparts. The choice follows the analysis of Moretti (2014) and is consistent with the predictors of Economic Complexity identified in the sections above. The variables used are Pre-treatment (year by year) of Economic Complexity Index, Share of gross capital formation (current PPPs) and Population taken from the Penn World Tables 9.0 as well as Share of Agriculture in value added (% of GDP), Share of Industry in value added (% of GDP), Secondary gross enrolment ratio, secondary, both sexes (%), both sexes) and Tertiary Gross enrolment ratio, (%), both sexes) from the World Bank Economic Indicators. Data is obtained for the period 1995-2015 to include the two separate years of accession of the new members (2006 for Romania and Bulgaria and 2004 for the other countries). We note that for some countries variables will not be used because of missing data. The variables are presented in the figure below which includes charts of the median values for all chosen countries (both in the treated and donor pools) along with some descriptive statistics for each.

- Gross Capital Formation has steadily increased over the group from 1995-2008 with a notable drop in 2008 that we attribute to the global financial crisis
- Share of Agriculture has steadily decreased across the group, ending at a 5% median in 2014. Industry remains at a higher level (31% median) although we do note a small decrease over the period of study (down 2pp between 1995-2014).
- Both secondary and tertiary enrolment rates recorded increases across the group with a notable surge in the latter which increased from 24% in 1995 to 66% in 2014.

Figure 1.4 Descriptive Statistics



ANALYSIS

We proceed with the synthetic control analysis of whether joining the EU had an impact on economic complexity in two steps: first, looking at each country separately, and afterward estimating aggregate average treatment effects.

For each of the ten CEE countries, we create a synthetic control which best reproduces its pre-2004 or 2007 socio-economic characteristics, as well as its trend in economic complexity. If we find a synthetic control that closely reproduces the trend in the dependent variable of our treated unit (say, the Czech Republic) prior to 2004, then we would expect their trends to remain similar after 2004 if the EU accession had no impact. Otherwise, if the two behave similarly before 2004, but there is a large difference after, we can infer that the difference is caused by the structural change. We match these cases on several independent variables, to get the synthetic control as similar as possible to its respective country. For Log Population, GFC, AGR, IND, SEC, and TER we take the mean values between 1994 and 2003 (1995:2006 in the cases of Romania and Bulgaria). To ensure that the synthetic control reproduces the path of the treated unit in the outcome prior to EU accession, we also set the algorithm to match their values in ECI for 2003, 2002, 2000, and 1998 for those which joined in 2004, and for 2006, 2004, 2002, and 2000 for Bulgaria and Romania.

Balance tables in the Appendices show comparisons between each country and its respective synthetic control on all these variables. On most variables, for all countries, we see that the country is closer to its synthetic control than to the sample mean. That indicates we created more comparable units than if we were comparing EU-accession countries to that sample alone. The exceptions are Hungary, in which cases the synthetic control is further away from the observed case than the unweighted sample mean on several

covariates. However, the good fit for the dependent variable before treatment still gives us confidence on estimates for these two countries.

Individual Country Results

In this section we present the results of our synthetic control analysis for each individual country that joined the European Union as part of the second and third waves of integration. Figure 1.5 contains the actual path of economic complexity index (ECI) of each country (solid line) along with its synthetic control counterpart (dashed line), and the unweighted sample mean (dotted line).

First, we notice how for all cases the synthetic control tracks the pre-2004/2007 behaviour of ECI much better than the sample mean would have. In addition, the actual country and its synthetic counterpart move in tandem prior to EU accession on their economic complexity. For at least five cases, we see that after entering the EU, a gap starts to appear between them and their synthetic versions, with their economies being more complex than the counterfactual. The results are particularly notable for five countries, including the three Baltic States: Estonia, Lithuania, Latvia as well as for Hungary and Romania. For these countries, our methodology shows that after accession to the EU, their economies became more complex than they otherwise would have, had they not become members of the common market.

The results are less consistent for Czech Republic, Poland, Slovakia, Slovenia and Bulgaria, where the changes are relatively small and where the post-2006 economic complexity remained very close to its synthetic control. We note however that four of those countries (Czech Republic, Poland, Slovakia, Slovenia) started out with higher levels of Economic Complexity than the rest of the group (significantly above the group average in 1995), which is an indication that integration to the European Union only benefited

countries whose initial product complexity was relatively low. The only exception is Bulgaria that started with relatively lower levels of complexity and whose accession to the European Union has not lifted the value of its index in a significant way.

In order to provide with a better understanding of the underlying dynamics of the product space produced and exported by the countries where we identified significant changes following their accession to the EU, we present a detailed breakdown of the evolution of their exports. As a preliminary overview, we first present each country total export value (SITC database) for the period of study.

Figure 1.5 Trends in complexity: treated countries vs. synthetic control

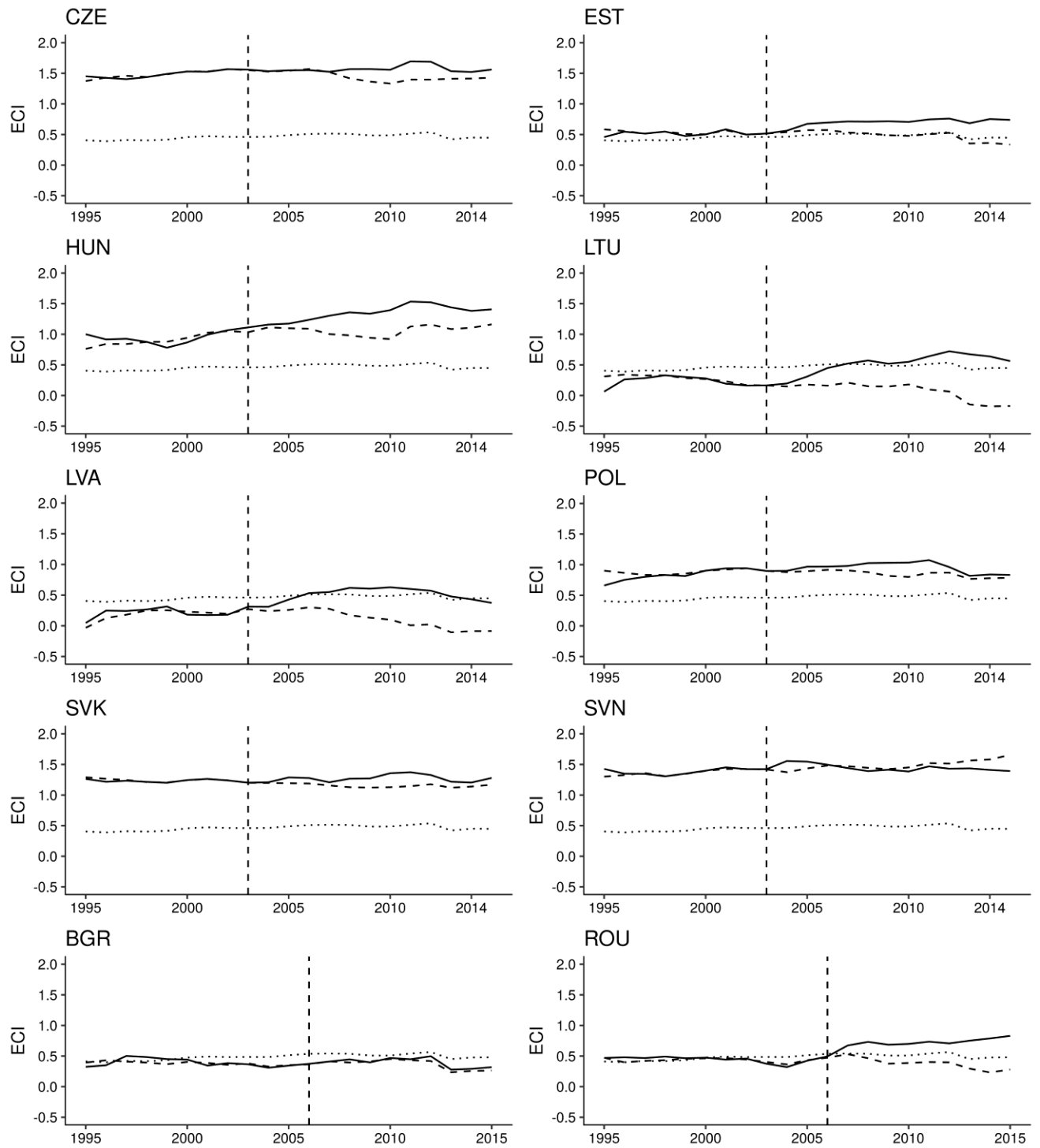
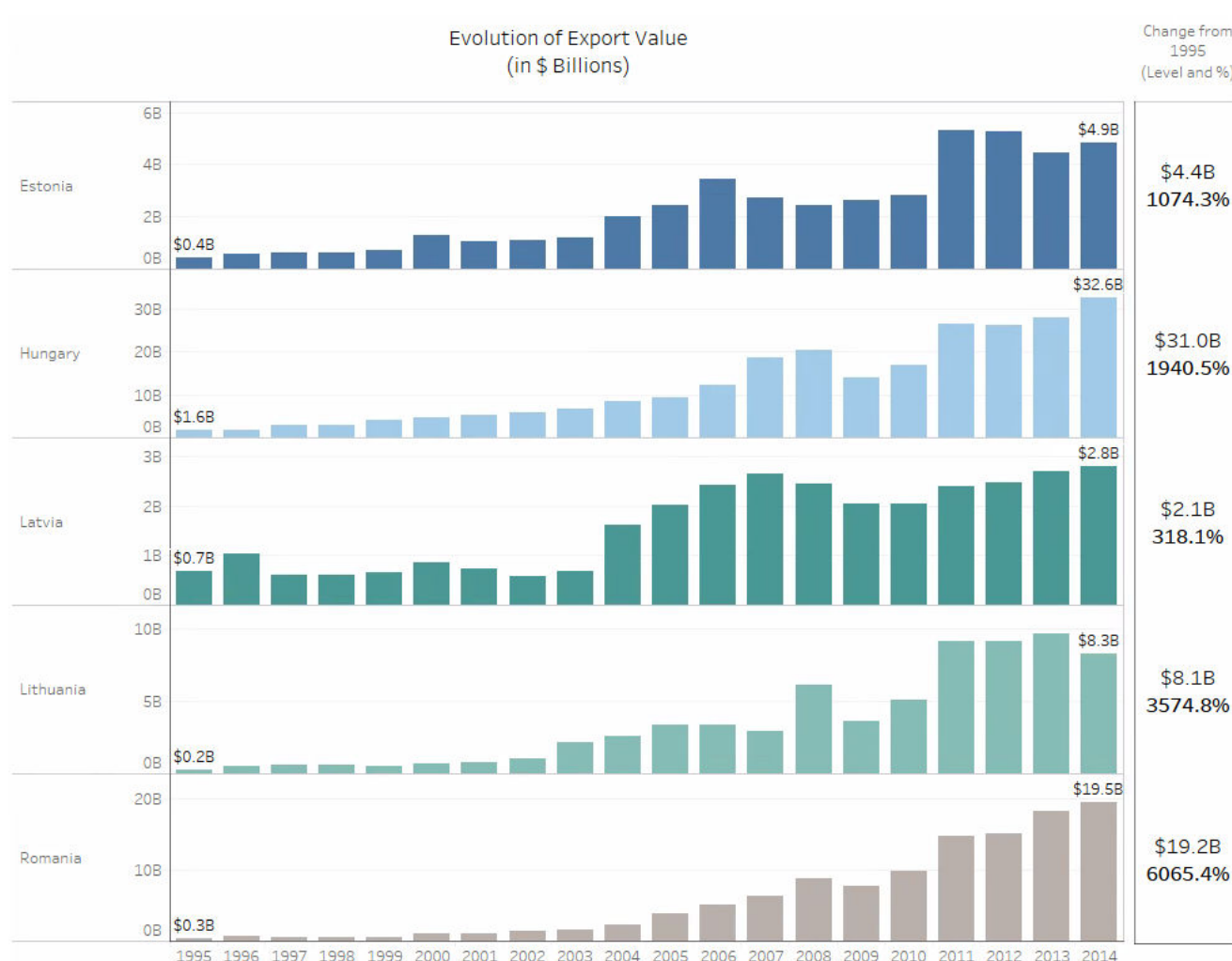


Figure 1.6. Evolution of Export Value for selected CEE countries



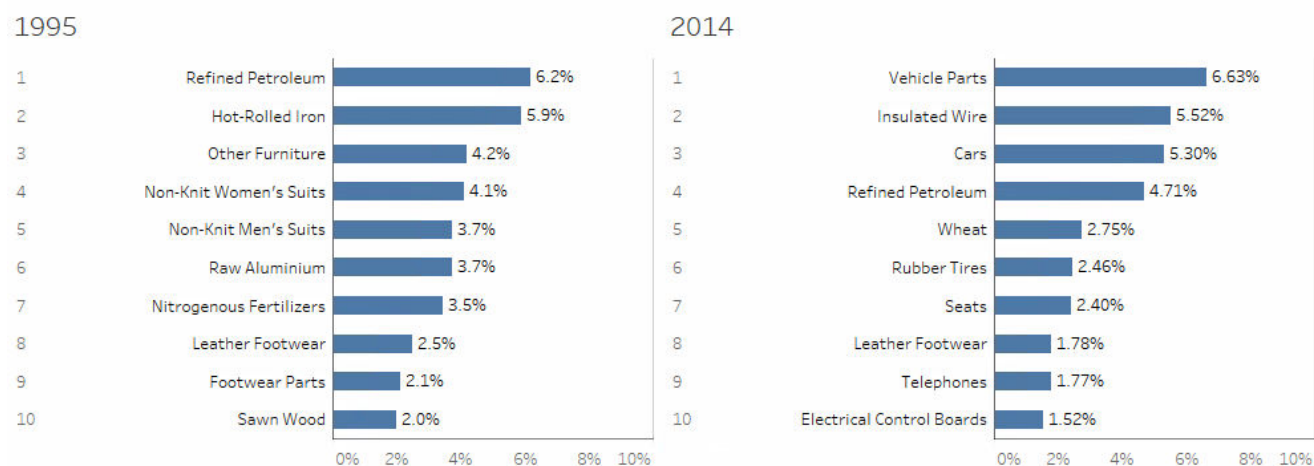
It is clear that export values have increased exponentially across the group, ranging from being multiplied by 4 (Estonia) to 61 (Romania) in the period of 1995-2014. The inflexion point occurs around the 2004 – 2007 for most countries with a notable dip in 2009-2010 which we can attribute to the global financial crises. While the graph shows us the clear increase in terms of dollar value, it does not necessarily include a measure of how the exported product space has evolved. In order to do so, we look at the top ten products of each individual country's export composition at the start and end year of the period of study. We rank the products by their share of total exports for that year and proceed to examine the composition of each product space. As a complementary analysis, we also look at the Relative Competitive Advantage index of the top ten countries in the last year and

examine their evolution over the period of study to assess whether the country has acquired a competitive advantage over a certain product as a result of its accession to the European Union. The results for all countries are presented in the appendix at the end of the paper. As a simple case study, we look at the example of Romania below.

In 1991, Romania's top product by their export share were primarily composed of raw materials (Petroleum, Iron, Aluminium) and Clothing manufacture (Footwear, Suits). At the end of the period of study, the country had a very different composition of top exported products, including Cars, Vehicle Parts, Telephones and Electrical Control Boards. It is clear that the more recent top exported products in the country have a much higher level of complexity in their production as opposed to the products the country exported in the early 90s. In addition, looking at the evolution of the RCA for those products, we note how the country gained a competitive advantage for Vehicle parts in 2008, Rubber Tires in 2007 and to a certain extent Cars and Telephones (although the evolution of the latter is more sporadic).

Figure 1.7. Evolution of export product complexity in Romania

Romania - Top 10 products by % total exports



Relative Competitive Advantage - Evolution of top 10 products in 2014

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Refined Petroleum	2.026	1.665	1.902	1.371	0.777	0.705	0.940	0.543	0.611	0.372	0.266	0.263	0.250	0.307	0.350	0.462	0.409	0.523	0.427	0.404
Insulated Wire	1.888	1.776	1.898	2.397	2.601	2.404	2.049	2.221	2.311	2.441	2.509	2.706	2.284	2.567	3.191	3.193	3.378	3.260	3.570	3.145
Vehicle Parts	0.131	0.555	0.440	0.313	0.335	0.298	0.336	0.410	0.463	0.571	0.782	0.840	0.976	1.115	1.626	1.634	1.675	1.683	1.917	1.939
Cars	0.382	0.195	0.144	0.270	0.146	0.223	0.340	0.350	0.392	0.763	1.050	1.184	1.338	1.265	0.596	0.564	0.592	0.501	0.469	0.504
Leather Footwear	0.213	0.176	0.203	0.325	0.191	0.210	0.246	0.315	0.266	0.293	0.393	0.508	0.678	0.838	0.769	0.670	0.708	0.645	0.673	0.658
Rubber Tires	0.496	0.492	0.649	0.807	0.588	0.729	0.861	0.896	0.907	0.846	0.757	0.874	1.076	1.093	1.076	1.103	1.207	1.082	1.096	1.020
Seats	0.211	0.362	0.307	0.254	0.246	0.286	0.264	0.247	0.304	0.315	0.431	0.531	0.670	0.817	0.714	0.600	0.579	0.625	0.764	0.704
Wheat	0.125	0.465	0.050	0.145	0.094	0.702	0.870	0.369	4.816	2.163	0.311	0.251	0.792	0.555	0.639	1.241	0.723	0.894	1.417	0.768
Telephones	0.923	0.941	1.247	1.429	1.048	1.666	1.301	1.115	0.906	1.108	0.806	0.938	0.723	0.768	0.955	1.633	1.834	0.808	0.713	0.748
Electrical Control Boards	1.122	0.935	1.422	2.115	1.607	1.421	1.650	1.321	1.682	1.431	1.393	1.282	1.242	0.927	1.019	1.212	1.068	1.121	1.252	1.051

For the other countries in our group, we observe the following results as to the evolution of the product complexity of the countries' exports:

- Estonia's top exported product in 2014 was Telephones, representing 13% of its total share of exports with a competitive advantage acquired in 2007. The country reduced its export dependency on petroleum (its main export in 1995) although it remains a significant part of its exports.
- Hungary's top product by export share was cars in 2014, representing close to 10% of the country's total exports, up from 2% in 1991. The country also increased its

production of Motor and vehicle parts, doubling its share from the beginning of the period of study.

- The effects are slightly more complex for Latvia and Lithuania whose exported products have not substantially increased in economic complexity, petroleum remaining the most important part of their exports throughout the period of study.

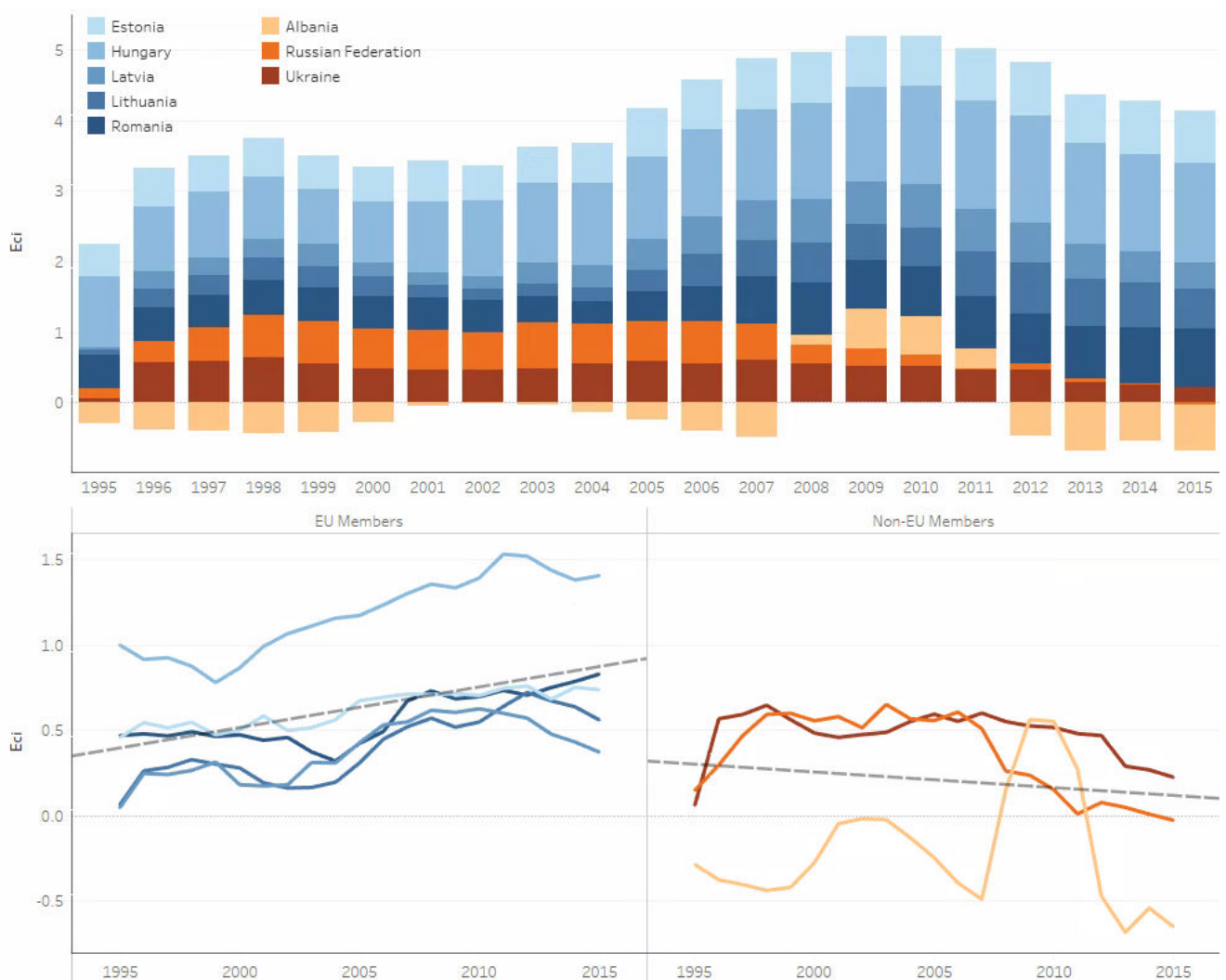
What our model indicates for these two countries however is that their levels of complexity would have been much lower had they not integrated the European Union, with noticeable decreases observable for their synthetic counterparts.

For Bulgaria, where no significant effect of export product complexity was observed after their integration in the European Union, we note that their export space remains highly dependent on raw materials (petroleum and copper) with now significant change in the complexity of the country's export composition.

As a final comparison, we examine the group of countries identified above (whose accession to the EU has presented significant benefits to their economic complexity) and compare them with a group of neighbouring countries that have not accessed the European Union (Albania, Ukraine and Russia). The evolution of the Index of Economic complexity of those countries is presented in Figure 1.8 below. The upper chart presents the indices of all countries grouped together. The inflexion point characterising the acceleration of complexity in EU members is clearly visible around the 2004-2005 mark: while indices were evenly distributed in the 90s, we see a significant shift occurring around the time of the accession, which is maintained until the last year of study. In addition, a simple linear regression for each group of countries shows clear opposite trends between the two: EU members have been on a growing path of economic complexity while non-members have seen their indices decline during the period of study. The latter countries have actually seen the complexity of their export space reduced as they increased their dependency on

exporting raw materials (petroleum, ore, iron). Albania for example, has shifted from an export space consisting primarily of clothing items in 1995 to one where petroleum and chromium ore represent more than a quarter of its total exports in 2014. This is an import result as it validates our synthetic model prediction that the Baltic states would have been worse off in terms of economic complexity had they not accessed the European Union.

Figure 1.8 Trends in economic complexity: comparison between members and non-members



Robustness tests

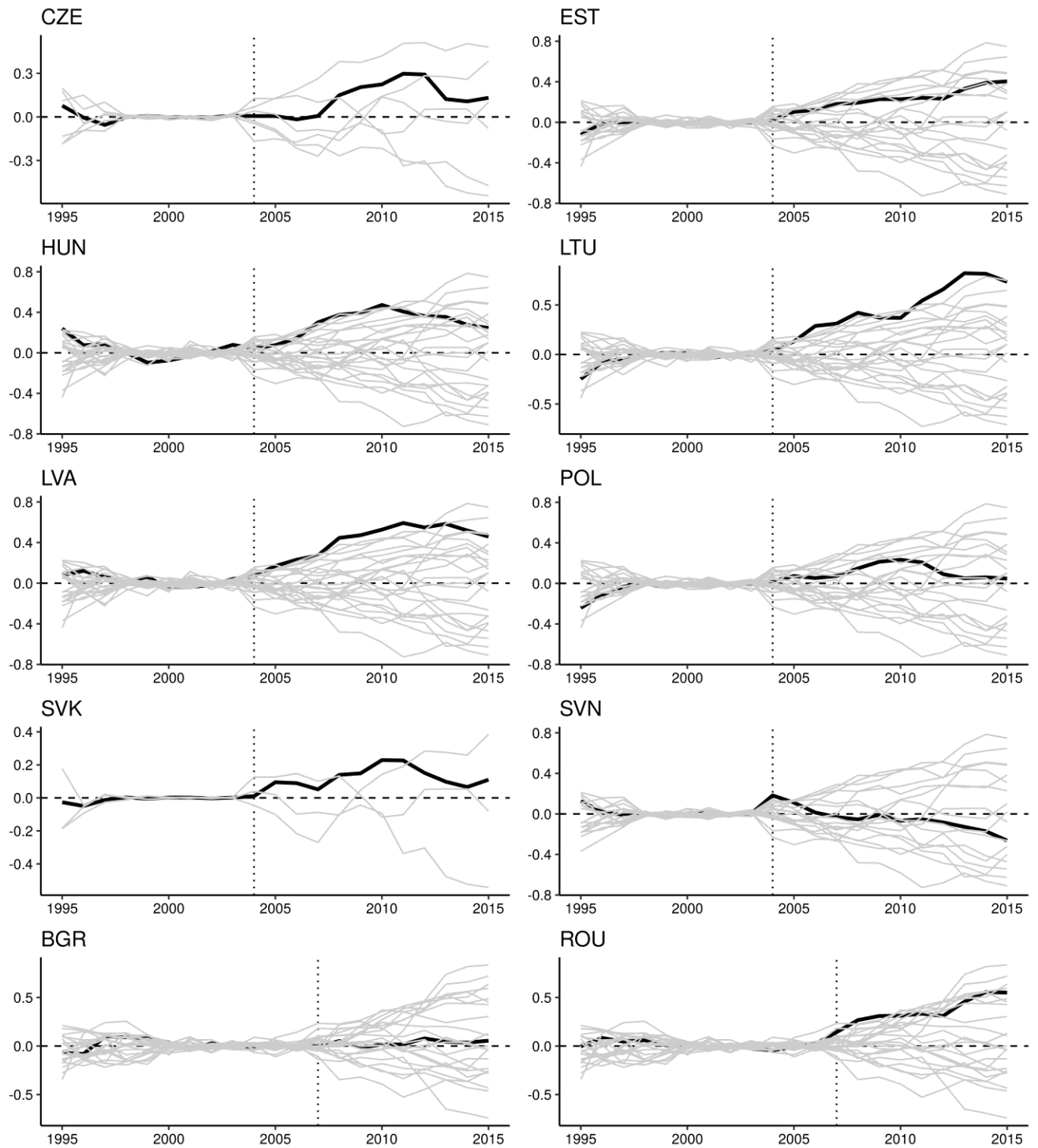
The simple fact that, after 2004 (or 2007) we don't try to keep the synthetic control as close as possible to the treated unit leads us to expect that at least a part of the gap after that time should emerge by chance. Countries' economic complexity is affected by several factors and develops in various different ways. To test whether these are not random variations, but actually effects of accession, we conduct what are called *placebo tests* (Abadie, Diamond, Hainmueller 2010, 2015). It consists of running the synthetic control algorithm for each unit in the *donor pool*, i.e., those that did not join the EU in 2004 and 2007. By looking at how much they diverge from their individual synthetic controls after the “treatment”, we get an estimate of how much the gap between treated unit and synthetic control would be by chance, meaning, without accession to the EU.

In Figure 1.9, each line is the difference between one country and its synthetic control. So, a value of 0 in the Y-axis indicates no difference between the two, while a value of 0.5 indicates that the treated unit had a value 0.5 higher than the synthetic control in that year. The 10 countries that joined the EU are in black in their respective graphs, while each placebo unit from the donor pool is in grey. These indicate the amount of difference between a unit and its synthetic control that we should expect purely by chance, without EU-accession.³ The clearest effects can be observed in Lithuania, Latvia and Romania: their lines are higher than almost all others in almost all post-2004 years. This means that it would be very unlikely to observe such an increase in ECI, after 2004, had no EU-accession taken place. The lines for Estonia and Hungary are also higher than most

³ We removed lines for those units from the donor pool that had a pre-treatment mean square prediction error (MSPE) more than ten times higher than that of the treated unit. Such a high MSPE means that no good synthetic control was found, and therefore they are not informative regarding the amount of post-treatment difference (Abadie, Diamond, Hainmueller 2010).

placebos at most times, while the rest of the countries (which we selected out of our analysis given their small deviations from their synthetic control path) do not look like their increase is significantly different from what we observe by chance, even under no accession to the EU.

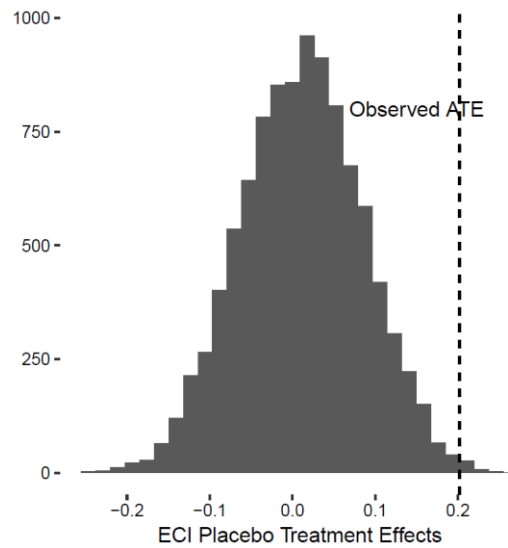
Figure 1.9. Economic complexity index gaps in treated country and placebo gaps



Average Treatment Effects

While treatment effects may vary for individual units, we test now whether the magnitude we observe on average, across all these cases, could have been observed by chance with any random ten countries that did not enter the EU. For that, we centre all observations on their EU-accession year, so that Bulgaria and Romania are added to the sample with the others. The formal test is a bootstrap approach following Ando (2015) and Cavallo et al. (2013). First, we calculate the average treatment effect for the treated (ATET) as the average of the average distance between each of the ten countries and its respective synthetic control after EU accession. For ECI, the value is 0.202 – meaning that, after accession, our countries are on average 0.202 higher on economic complexity than we would expect them to be if they did not enter the EU. Next, for each outcome, we take a random sample of ten placebos (eight from 2004, two from 2007), and calculate the average treatment effect in this sample. By redrawing samples 10,000 times, we get a distribution of average treatment effects for placebos, given no EU-accession – that is how much, on average, we should expect that 10 countries would deviate from their synthetic control after 2004 or 2007, on economic complexity, without joining the EU. The histogram with the distribution of placebo effects and the actual treatment effects are in Figure 1.10.

Figure 1.10 Placebo Effect Histogram



In our case, we see that the observed treatment effect, denoted by the dashed lines, are to the upper extreme of the respective distributions. For ECI, only in 60 bootstrapped samples there is an absolute estimated effect higher than 0.202, meaning $p = .006$ in a two-tailed test. Given these results, it seems highly unlikely that ten random countries which have not joined the EU would have seen an increase in their ECI to the levels observed here.

CONCLUSION

This paper has taken a new path of analysis in evaluating the benefits of EU accession. By combining the methodology of synthetic control with the index of Economic Complexity, our study has shown the effects of the integration of new EU members on the complexity of their export product space. Building synthetic counterparts of the new member countries, we have been able to analyse the evolution of the economic complexity of our treatment group in the synthetic scenario where they have not joined the EU. Our results have shown a clear divergence between actual and synthetic paths of a distinct group of countries, which provides evidence of the benefits of accession on the complexity of product exports. EU accession has benefited the most countries with low initial levels of complexity (less than one ECI in 1995) in attaining a product space they would not have achieved in the same time scale without becoming members. The effects were particularly significant for the Baltic States (Estonia, Latvia and Lithuania) as well as Romania and Hungary. In parallel, countries with high initial levels of export product complexity (Czech Republic, Poland, Slovenia and Slovakia) have shown no distinct evolution attributed to their EU accession. An exception to the rest of the group, Bulgaria is the only country of the group that has initially low levels that how show no concrete evolution in its export product space from its accession to the EU. Our results have passed robustness checks provided by placebo testing to confirm deviations are not random in nature, as well as a positive average treatment effect over the group. These results also point at the intuition provided by the literature of a converging effect of complexity with countries pertaining to the more complex group having a slower rate of growth than the ones with lower levels of complexity. By joining the European Union, Hungary, Romania and the Baltic states achieved higher export sophistication than they would have in the counterfactual scenario.

From a policy perspective, the next step would be a detailed examination of the mechanisms of EU accession on complexity and how integration of these countries has fostered a positive environment for the development of their product export space. In particular, focus should be placed on the impact that EU integration had in terms of strategies favouring healthy a business environment, research, development and innovation, trade-related reform as well as education targeted policies, which are all determinants of a developed product sophistication. As a starting point, we provide some intuition in how this mechanism would have operated for states where significant impact was identified:

- In the case of Hungary and Romania, the rapid growth of the car industry is a key component in the development of the economic complexity of these countries post EU accession. The attraction of EU integration on foreign investment has resulted in a substantial expansion of the automotive market in these countries with major investments from international manufacturers. In the case of Romania, the local automotive industry has risen at an average of 18% per year since 2009, reaching 18 billion euros in 2014 backed by exports (ACAROM statistics). Renault and Ford have taken a big part of the market for their projects in producing car components for export and are planning major technological developments in the production of eco-friendly vehicles. Similarly, for Hungary, the automotive industry has become a main pillar of the country's economy with GM and Audi establishing in 2010 major factories for international export of engines and other vehicle parts. From this perspective, EU membership has induced these countries to reform their legal system in order to become compliant with Western Standards which, paired with waves of privatisation, has succeeded in attracting foreign investment from international manufacturers. While there are many locations that can offer relatively

lower labour costs, the focus of these countries has been to offer a competitive advantage in expertise and labour productivity with employment policies shifting to focus on a skilled and internationally competitive workforce as opposed to just providing low-cost labour.

- For the Baltic states, our results have shown how accession to the EU has maintained complexity at a steady level without providing tangible growth. However, our model also indicates that these countries would have experienced declining levels of complexity had they not joined, as has been observed for neighbouring countries highly dependent on natural resources (Russia, Ukraine and Albania). Given their geographical location, the Baltic countries have a history of being at the crossroads between Western Europe and the Russian pipelines. This specific position has targeted their desire to join the EU as a primary strategy to guarantee their independence. Therefore, understanding their transition to the EU and the mechanisms that allowed their economy not to slip in a pure focus on natural resources becomes crucial in order to ensure that the similar scenarios are prevented in the future. Particularly for Bulgaria and for potential future members like Albania (which exhibited declining levels of complexity), a clear understanding of the future impact of EU energy strategies on renewables will become a key component in the development of product complexity in these countries. For countries heavily dependent on the export of natural resources, policies implemented today will define the evolution of their manufactured products in the coming environment of energy transition over the next decades.

Overall, this paper has been an attempt at analysing the complex phenomenon of the impact EU integration on the sophistication of the product export space of new joining members. Economic Complexity is a forefront tool in the evolution of international trade

theory and provides a new path in being able to condense complex mechanisms into intuitive economic results. Particularly in the era of “Big Data”, it becomes important to understand the essence of the trade flows and the composition of a country’s export to be able to provide robust perspectives for the future. In our attempt, we hope to have provided a starting point for the analysis of export product complexity within the EU and the impact of integration for the new members, their future within the union and perspectives for new joiners.

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APPENDIX 1.1. ECONOMIC COMPLEXITY INDEX

The economic complexity index is computed for each country using the methodology below.

We define M_{cp} as a matrix that is 1 if country c produces product p and 0 otherwise. The diversity and ubiquity of a product in the country are obtained by summing the rows and columns of the M :

$$Diversity = k_{c,0} = \sum_p M_{cp} \quad (1)$$

$$Ubiquity = k_{p,0} = \sum_c M_{cp} \quad (2)$$

To generate a more accurate measure of the number of capabilities available in a country, or required by a product, we need to correct the information that diversity and ubiquity carry by using each one to correct the other. For countries, this requires us to calculate the average ubiquity of the products that it exports, the average diversity of the countries that make those products and so forth. For products, this requires us to calculate the average diversity of the countries that make them and the average ubiquity of the other products that these countries make. This can be expressed by the recursion:

$$k_{c,N} = \frac{1}{k_{c,0}} \sum_p M_{cp} \cdot k_{p,N-1} \quad (3)$$

$$k_{p,N} = \frac{1}{k_{p,0}} \sum_c M_{cp} \cdot k_{c,N-1} \quad (4)$$

Plugging (4) into (3) and simplifying, we obtain:

$$k_{c,N} \sum_p \tilde{M}_{cc'} k_{c',N-2} \quad (5)$$

$$\tilde{M}_{cc'} = \sum_p \frac{M_{cp} M_{c'p}}{k_{c,0} k_{p,0}} \quad (6)$$

We note (5) is satisfied when:

$$k_{c,N} = k_{c,N-2} = 1$$

This is the eigenvector of $\tilde{M}_{cc'}$ which is associated with the largest eigenvalue. Since this eigenvector is a vector of ones, it is not informative. We look, instead, for the eigenvector associated with the second largest eigenvalue. This is the eigenvector that captures the largest amount of variance in the system and is our measure of economic complexity. Hence, we define the Economic Complexity Index (ECI) as:

$$ECI = \frac{\vec{K} - \langle \vec{K} \rangle}{\text{stdev}(\vec{K})} \quad (7)$$

where $\langle \rangle$ represents an average, stdev stands for the standard deviation and

$\vec{K} = \text{Eigenvector of } \tilde{M}_{cc'} \text{ associated with second largest eigenvalue}$

APPENDIX 1.2. COUNTRY DATA

Bulgaria

Country Weights

Argentina	
Australia	
Belarus	
Brazil	
Chile	
China	
Colombia	
Croatia	
Egypt	30.6%
Hong Kong	
Israel	
Japan	
Korea, Rep.	
Malaysia	
Mexico	
Morocco	
New Zealand	
Philippines	21.3%
Russia	
Switzerland	22.2%
Thailand	
Tunisia	
Turkey	
Ukraine	
Uruguay	25.8%

100%

0%

Egypt
31%

Philippines
21%

Switzerland
22%

Uruguay
26%

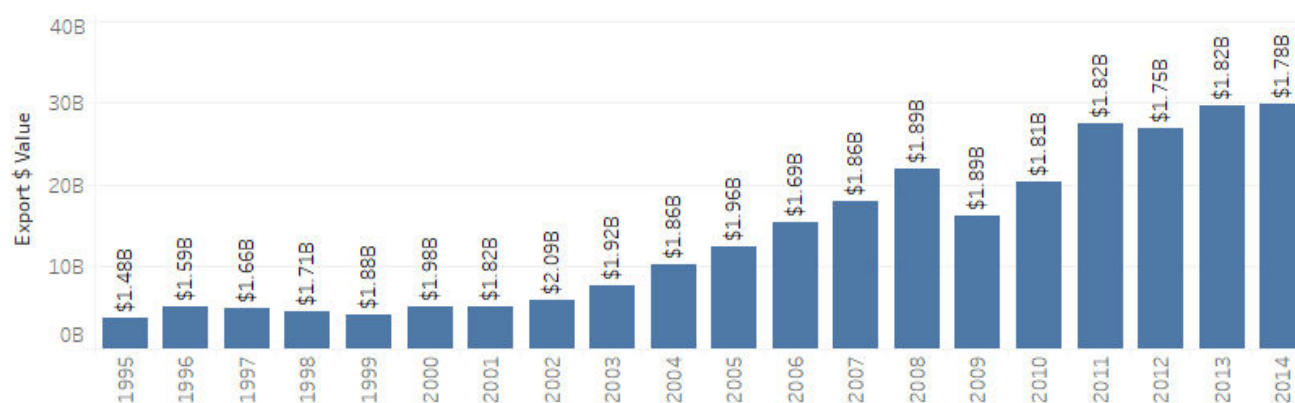
Balance Tables

Treated

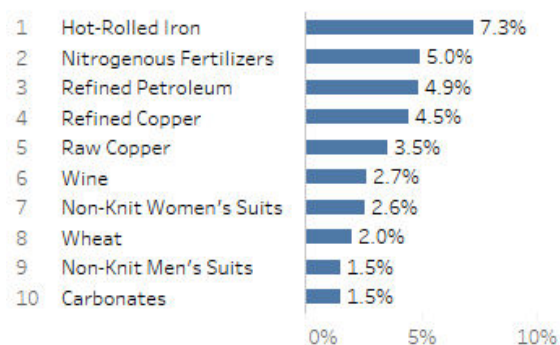
Synthetic

Sample Mean

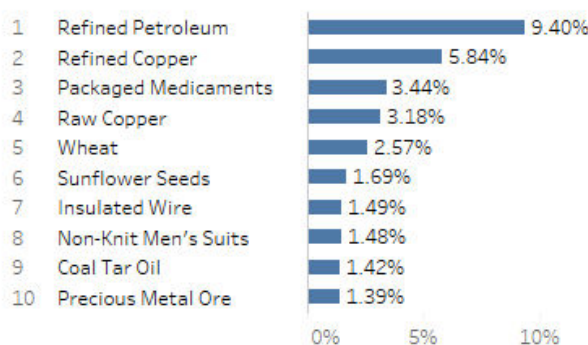
gfc	0.14	0.19	0.23
logpop	15.90	16.80	17.23
agr	12.65	10.75	8.25
ind	26.23	30.42	31.93
sec	91.75	86.73	86.62
ter	42.58	32.93	38.66
eci.2000	0.44	0.40	0.48
eci.2002	0.38	0.36	0.48
eci.2004	0.31	0.33	0.48
eci.2006	0.37	0.39	0.54



1995 - Top Exports

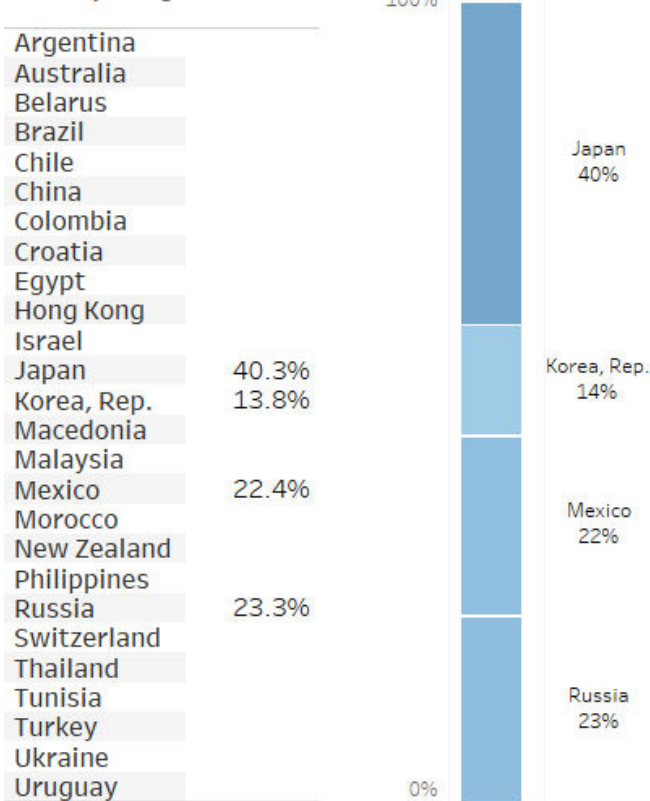


2014 - Top Exports

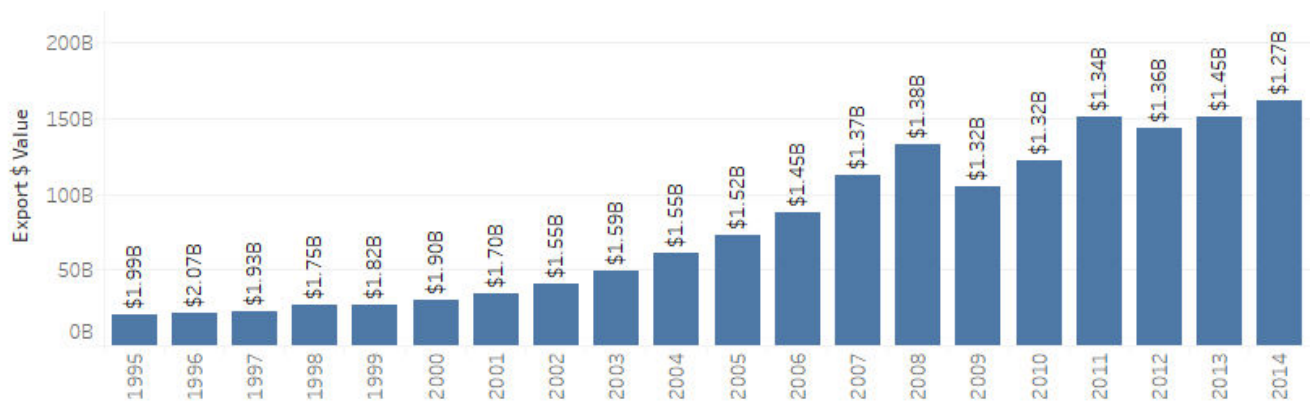


Czech Republic

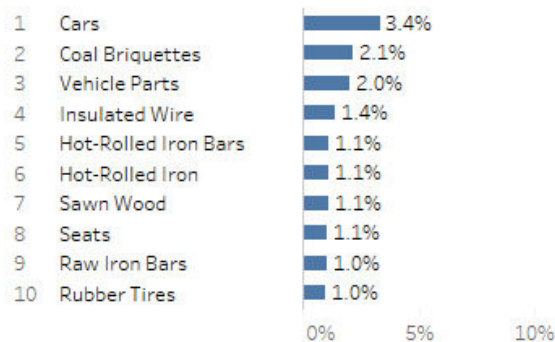
Country Weights



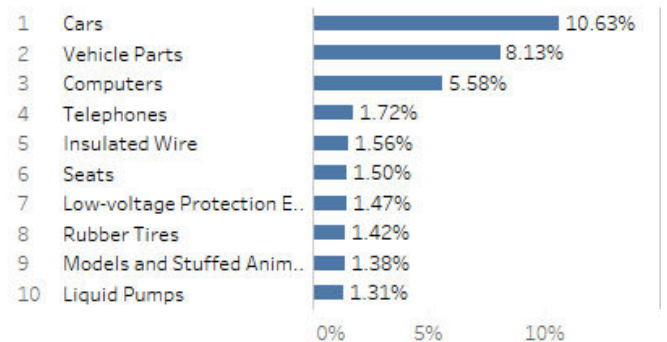
Balance Tables	Treated	Synthetic	Sample Mean
gfc	0.25	0.26	0.23
logpop	16.15	18.50	17.11
agr	3.59	3.75	8.88
ind	38.09	34.77	31.86
sec	91.17	90.70	84.61
ter	26.43	44.43	34.89
eci.1998	1.44	1.44	0.40
eci.2000	1.53	1.53	0.46
eci.2002	1.57	1.57	0.46
eci.2003	1.56	1.55	0.46



1995 - Top Exports



2014 - Top Exports



Estonia

Country Weights

Argentina	1.3%
Australia	
Belarus	20.7%
Brazil	
Chile	
China	
Colombia	
Croatia	3.8%
Egypt	
Hong Kong	4.9%
Israel	
Japan	
Korea, Rep.	
Macedonia	7.8%
Malaysia	
Mexico	
Morocco	
New Zealand	34.8%
Philippines	
Russia	4.2%
Switzerland	8.9%
Thailand	
Tunisia	
Turkey	
Ukraine	
Uruguay	5.6%

100%

0%

Belarus
21%

Macedonia
8%

New Zealand
35%

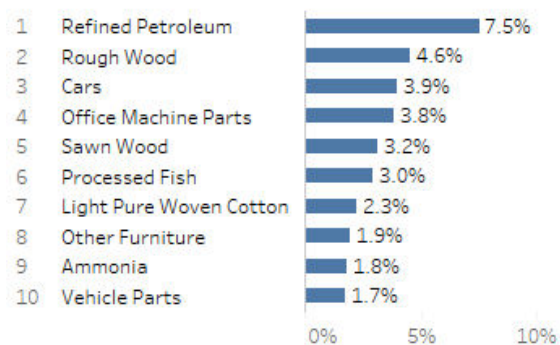
Switzerland
9%

Balance
Tables

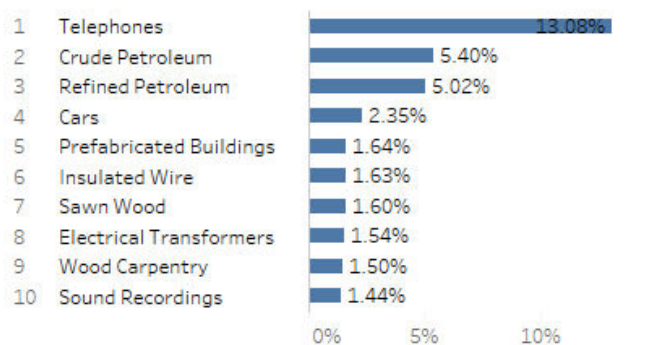
	Treated	Synthetic	Sample Mean
gfc	0.21	0.21	0.23
logpop	14.15	15.77	17.11
agr	4.94	8.80	8.88
ind	29.11	29.23	31.86
sec	96.01	96.82	84.61
ter	47.02	46.97	34.89
eci.1998	0.55	0.55	0.40
eci.2000	0.50	0.50	0.46
eci.2002	0.50	0.50	0.46
eci.2003	0.52	0.52	0.46



1995 - Top Exports

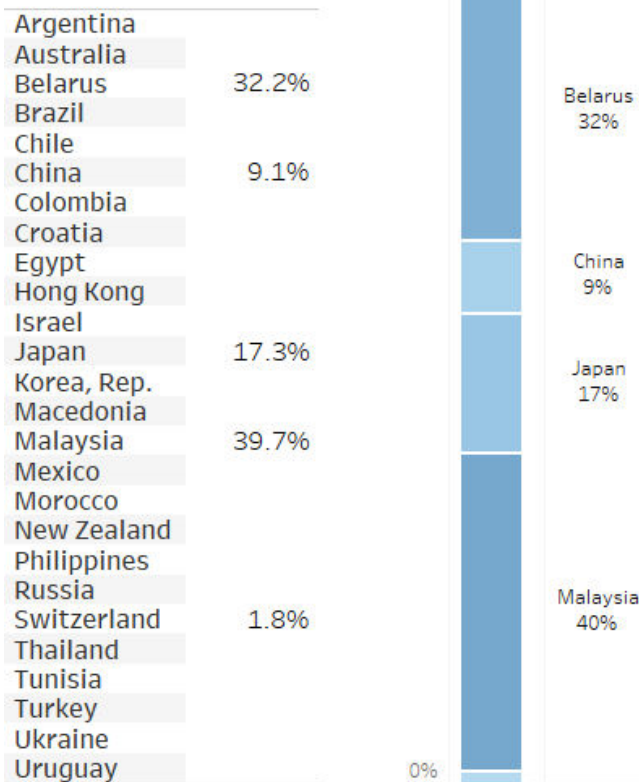


2014 - Top Exports

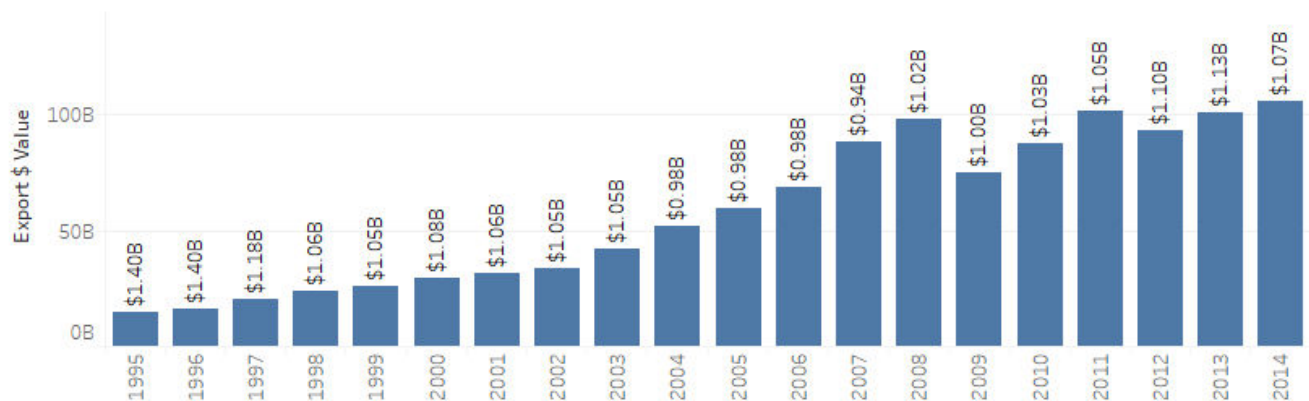


Hungary

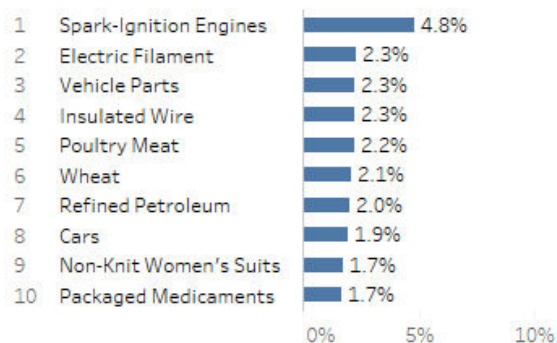
Country Weights



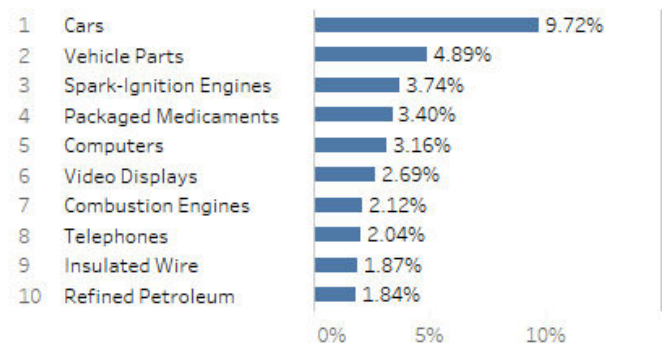
Balance Tables	Treated	Synthetic	Sample Mean
gfc	0.19	0.28	0.23
logpop	16.14	17.31	17.11
agr	6.40	10.63	8.88
ind	31.28	40.45	31.86
sec	94.63	79.25	84.61
ter	32.75	33.78	34.89
eci.1998	0.88	0.88	0.40
eci.2000	0.87	0.94	0.46
eci.2002	1.07	1.05	0.46
eci.2003	1.11	1.03	0.46



1995 - Top Exports

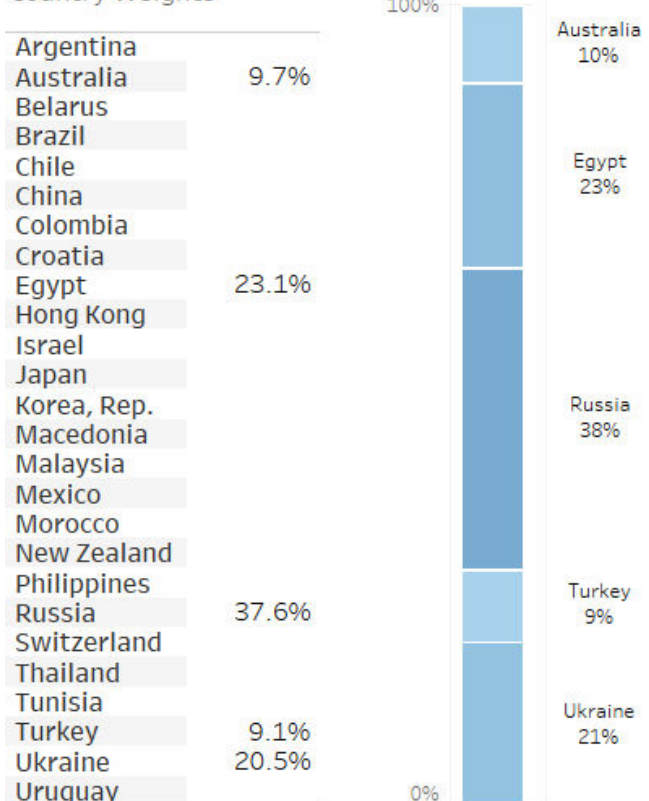


2014 - Top Exports

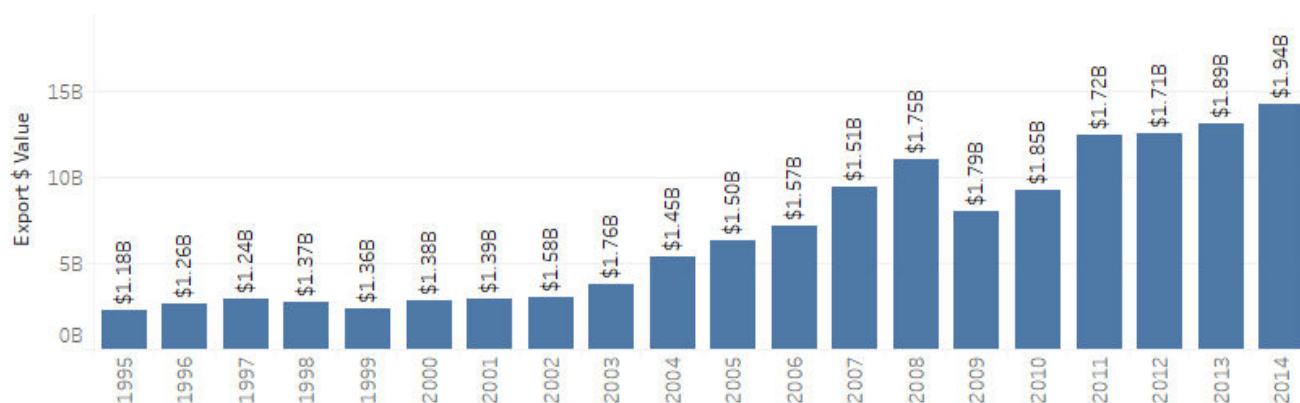


Latvia

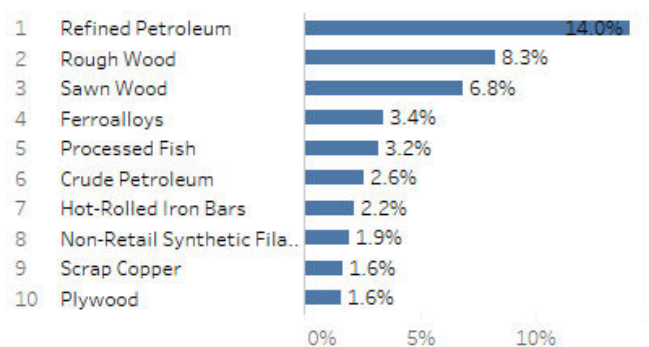
Country Weights



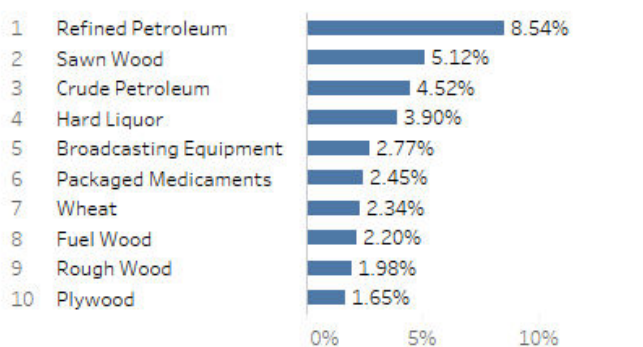
Balance Tables	Treated	Synthetic	Sample Mean
gfc	0.16	0.16	0.23
logpop	14.69	18.13	17.11
agr	5.65	10.98	8.88
ind	27.78	34.76	31.86
sec	90.52	93.80	84.61
ter	46.08	45.13	34.89
eci.1998	0.27	0.25	0.40
eci.2000	0.18	0.23	0.46
eci.2002	0.18	0.20	0.46
eci.2003	0.31	0.27	0.46



1995 - Top Exports

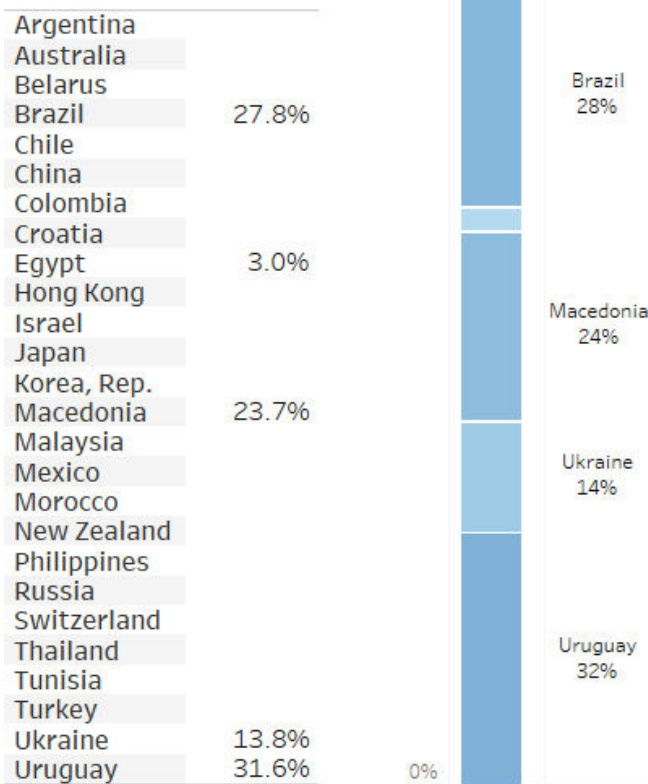


2014 - Top Exports

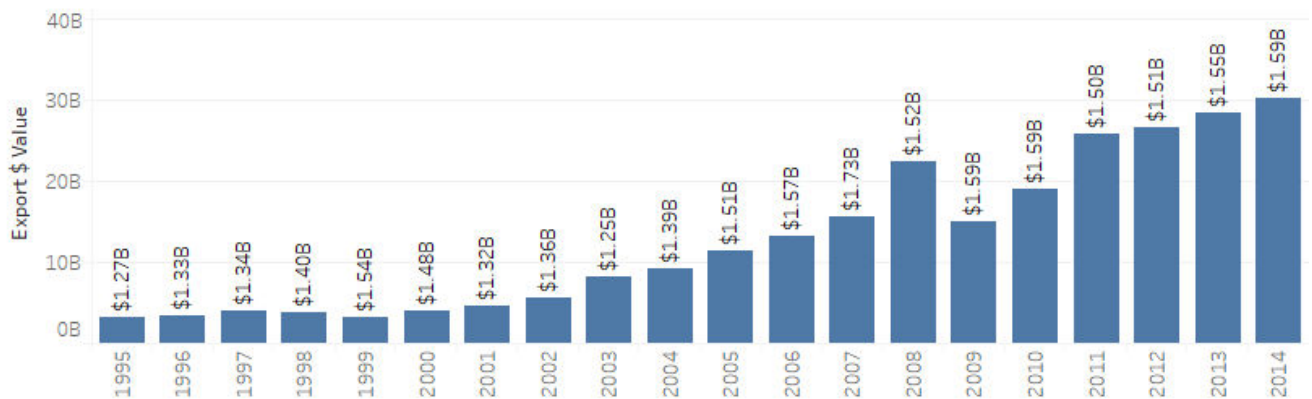


Lithuania

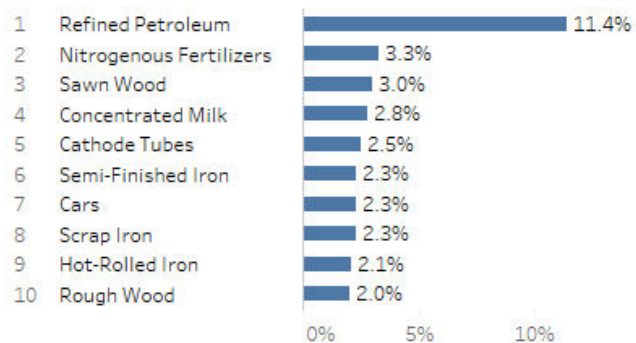
Country Weights



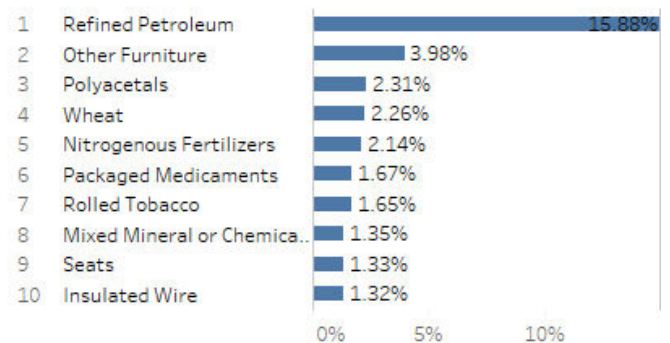
Balance Tables	Treated	Synthetic	Sample Mean
gfc	0.13	0.17	0.23
logpop	15.08	16.46	17.11
agr	8.00	9.85	8.88
ind	30.44	29.10	31.86
sec	94.29	94.14	84.61
ter	43.18	28.63	34.89
eci.1998	0.33	0.33	0.40
eci.2000	0.28	0.27	0.46
eci.2002	0.16	0.17	0.46
eci.2003	0.17	0.16	0.46



1995 - Top Exports



2014 - Top Exports



Poland

Country Weights

Argentina	1.6%
Australia	16.5%
Belarus	4.9%
Brazil	
Chile	
China	
Colombia	
Croatia	1.4%
Egypt	
Hong Kong	
Israel	1.2%
Japan	27.1%
Korea, Rep.	
Macedonia	1.3%
Malaysia	
Mexico	17.2%
Morocco	
New Zealand	1.2%
Philippines	4.6%
Russia	2.5%
Switzerland	1.1%
Thailand	
Tunisia	14.2%
Turkey	
Ukraine	1.2%
Uruguay	1.0%

100%



Australia
17%

Japan
27%

Mexico
17%

Tunisia
14%

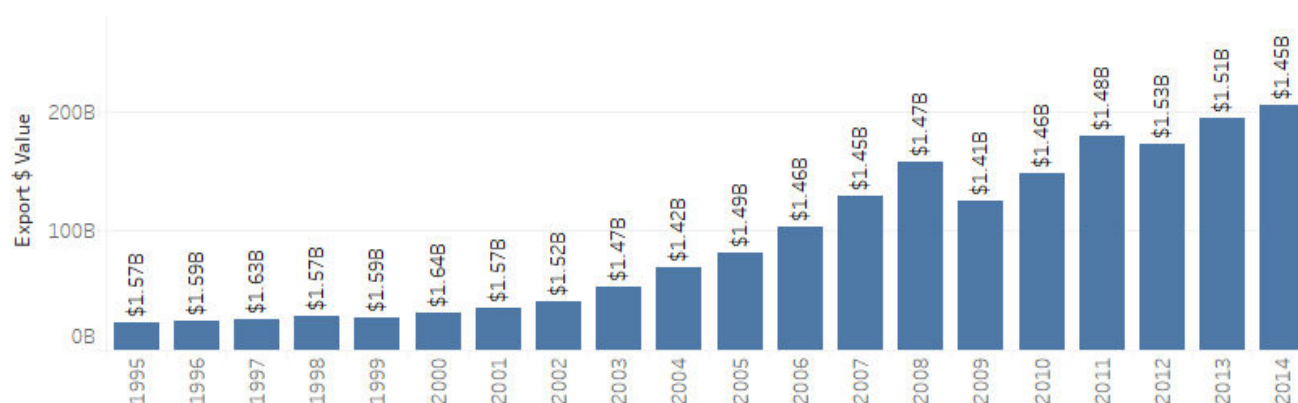
Balance
Tables

Treated

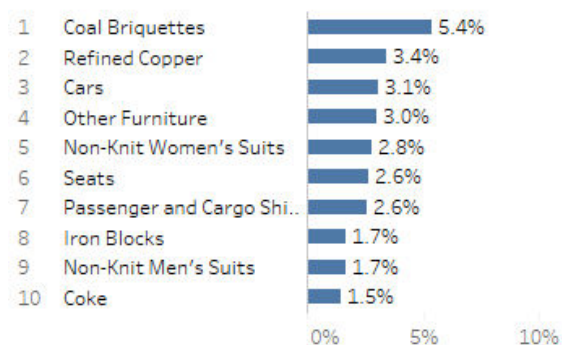
Synthetic

Sample
Mean

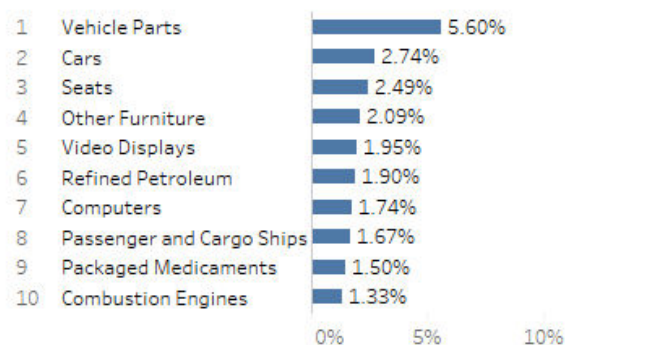
gfc	0.18	0.24	0.23
logpop	17.47	17.47	17.11
agr	4.00	6.06	8.88
ind	33.41	31.71	31.86
sec	98.29	95.51	84.61
ter	44.49	39.62	34.89
eci.1998	0.83	0.83	0.40
eci.2000	0.90	0.90	0.46
eci.2002	0.94	0.94	0.46
eci.2003	0.90	0.90	0.46



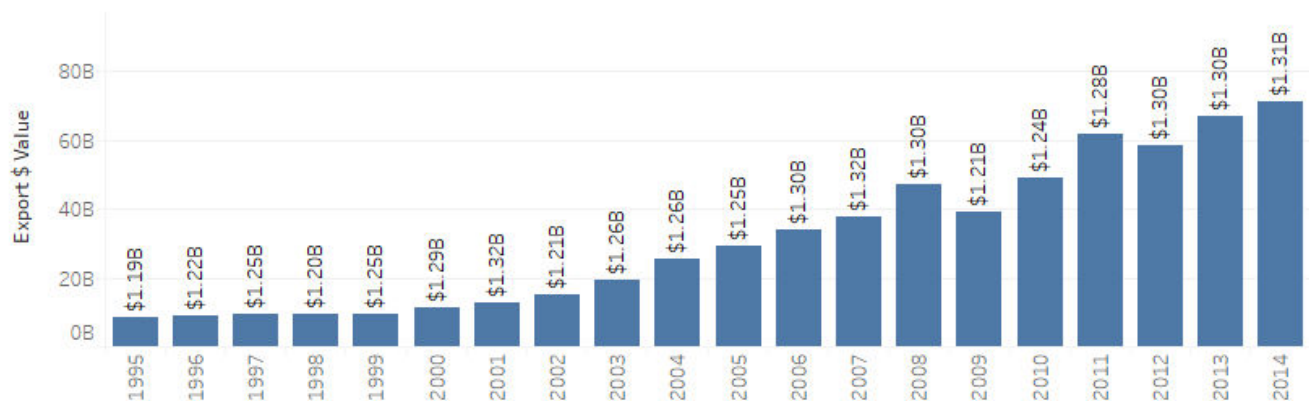
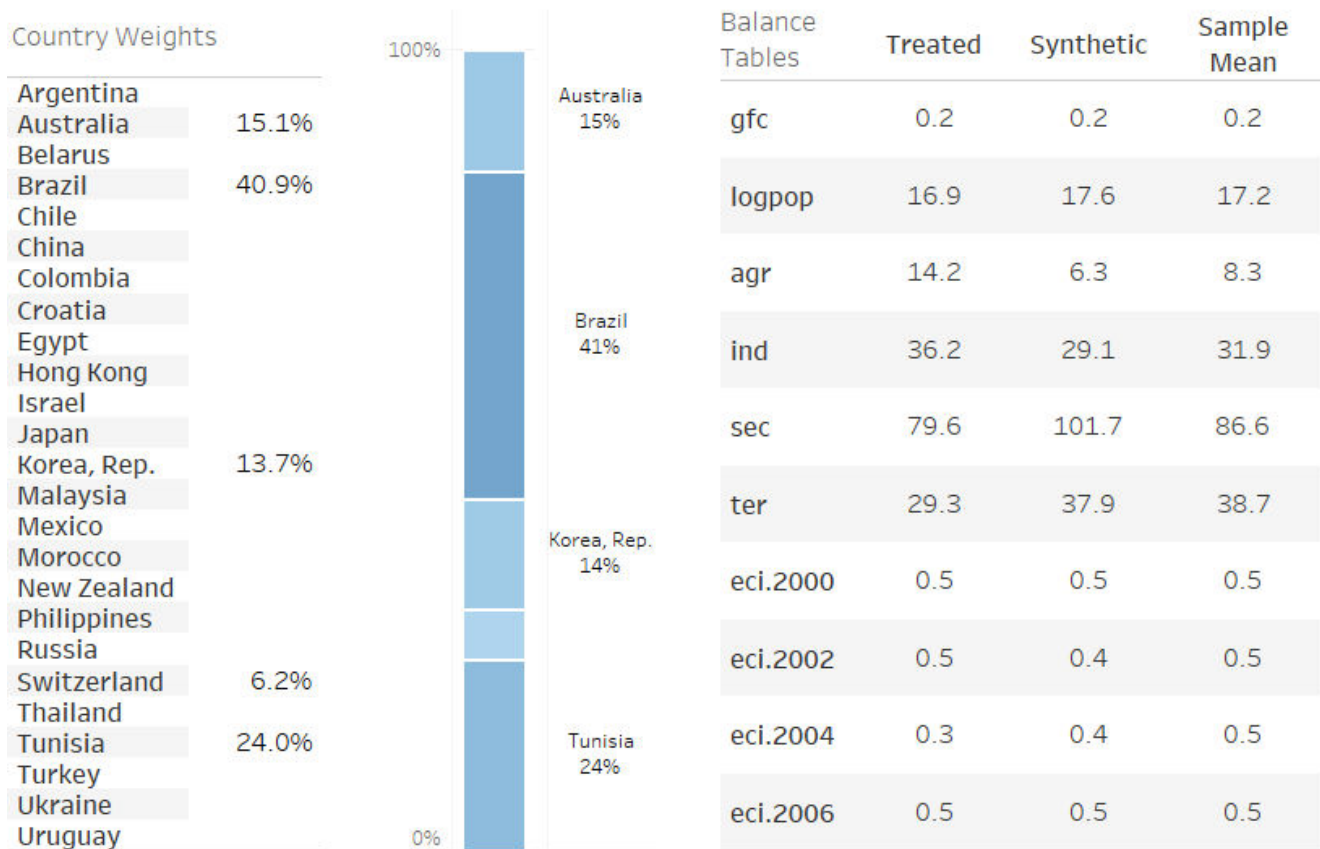
1995 - Top Exports



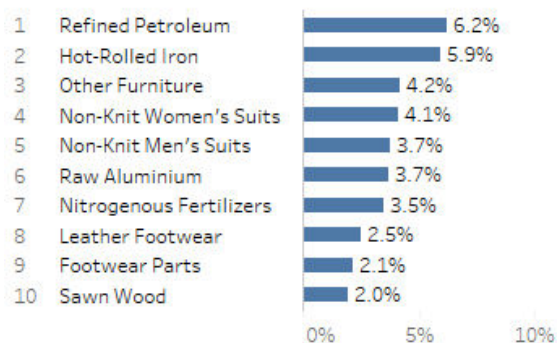
2014 - Top Exports



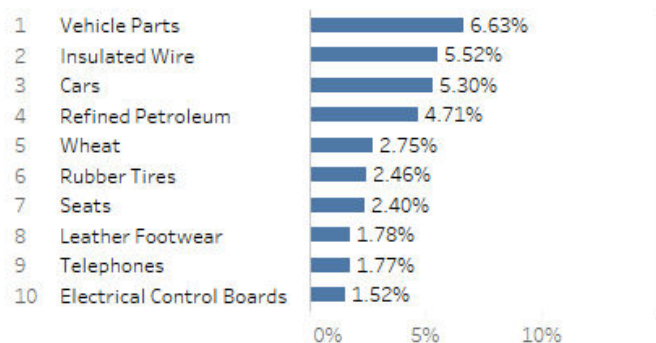
Romania



1995 - Top Exports

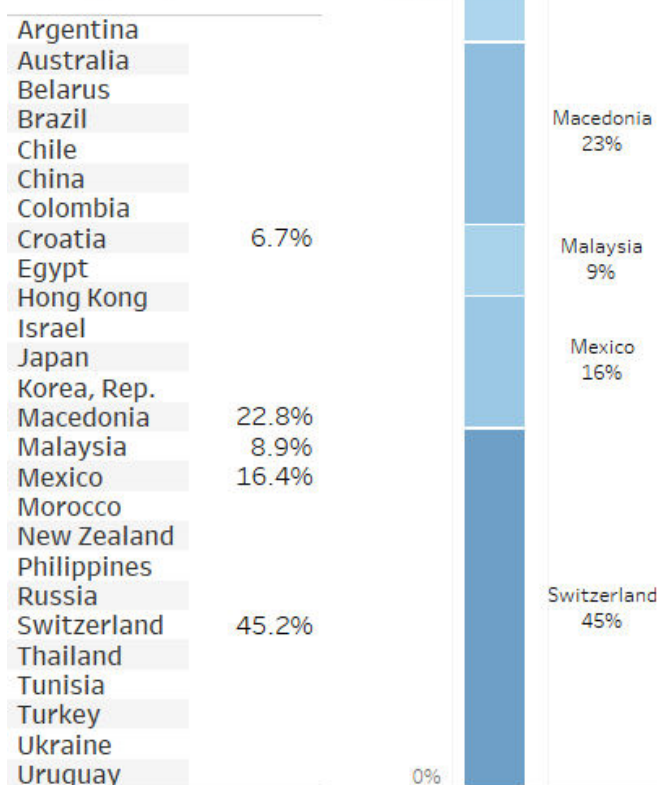


2014 - Top Exports

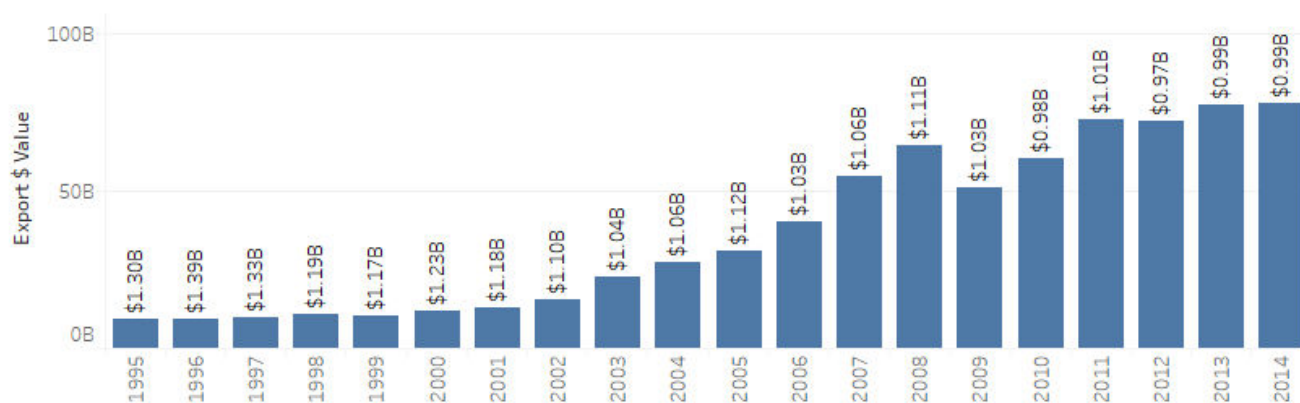


Slovakia

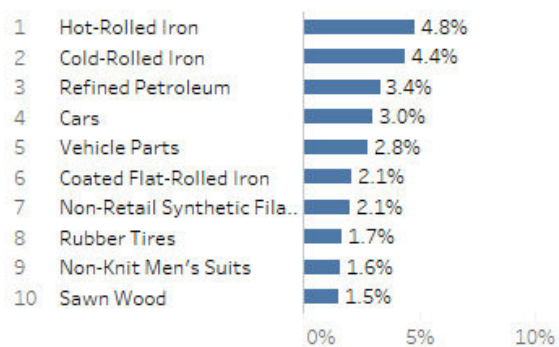
Country Weights



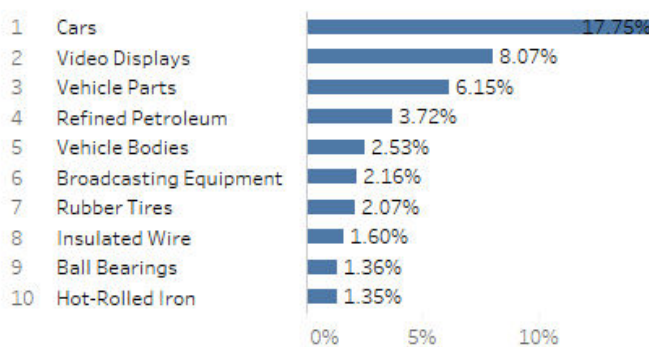
Balance Tables	Treated	Synthetic	Sample Mean
gfc	0.21	0.25	0.23
logpop	15.50	16.00	17.11
agr	4.95	5.54	8.88
ind	35.36	30.83	31.86
sec	87.95	84.28	84.61
ter	25.23	28.13	34.89
eci.1998	1.22	1.21	0.40
eci.2000	1.25	1.24	0.46
eci.2002	1.24	1.24	0.46
eci.2003	1.20	1.20	0.46



1995 - Top Exports

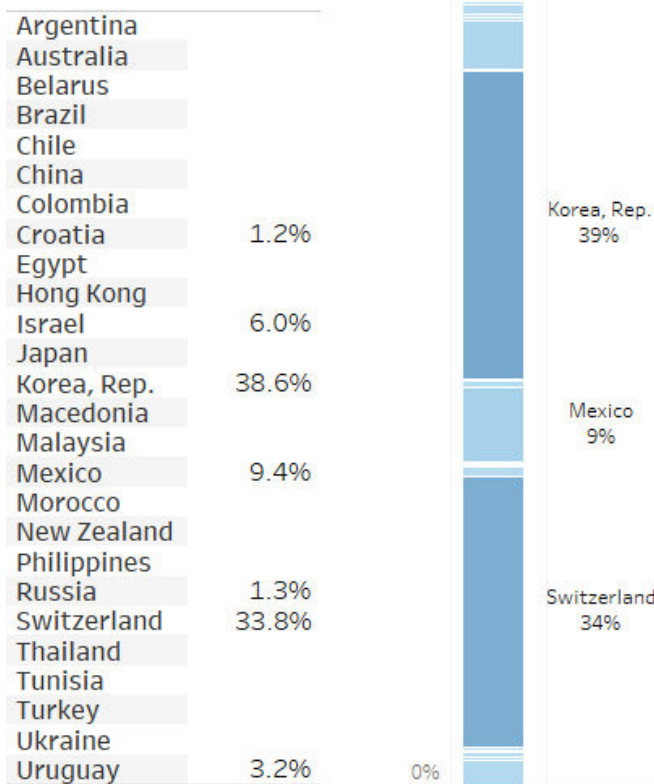


2014 - Top Exports

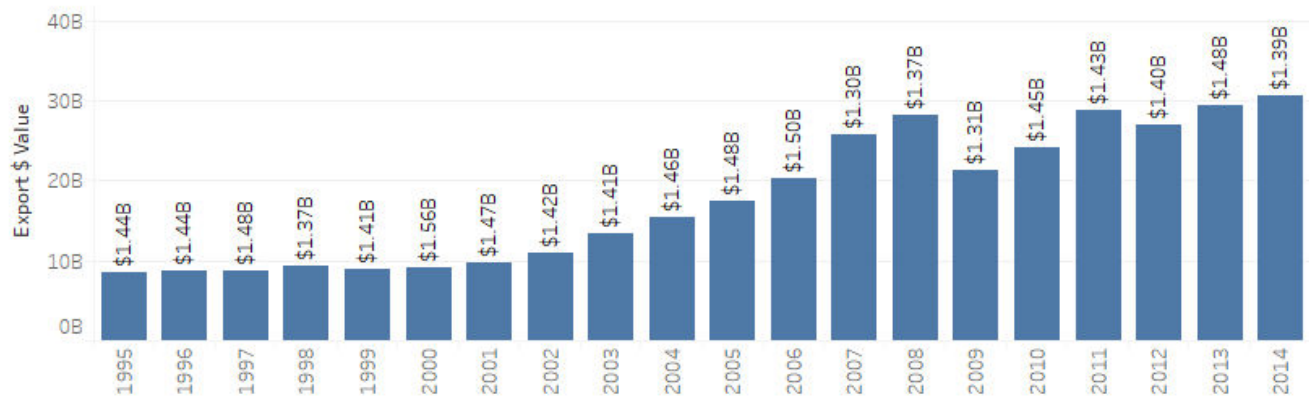


Slovenia

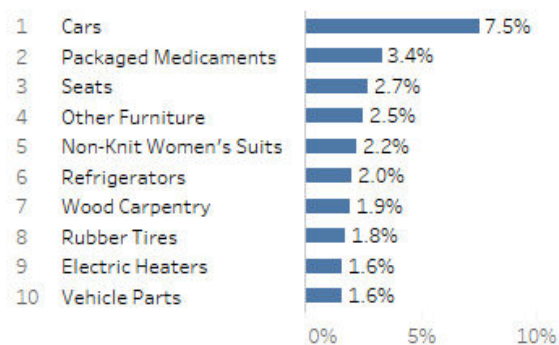
Country Weights



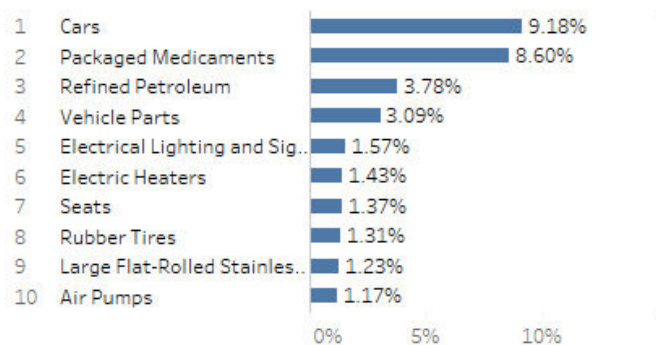
Balance Tables	Treated	Synthetic	Sample Mean
gfc	0.27	0.30	0.23
logpop	14.50	16.84	17.11
agr	3.50	3.87	8.88
ind	35.16	32.62	31.86
sec	97.65	93.18	84.61
ter	47.93	47.89	34.89
eci.1998	1.31	1.31	0.40
eci.2000	1.40	1.40	0.46
eci.2002	1.42	1.43	0.46
eci.2003	1.42	1.42	0.46



1995 - Top Exports



2014 - Top Exports



CHAPTER II.

IMPACT OF HARD AND SOFT INFRASTRUCTURE: EVIDENCE FROM NORTH AFRICA AND CEECS⁴

INTRODUCTION

Deeper regional integration is crucial for North Africa development. Despite close historical and linguistic ties between these countries, North African economies remain mostly isolated towards each other's and towards the European Union (EU), which is one of their most important trade partners. A recent United Nations Economic Commission for Africa (UNECA) report estimated that they were barely at 50 percent of their trade potential. Yet, the creation of the Arab Maghreb Union in 1989 should have been the starting point of closer economic relationships in North Africa through trade liberalization, but trade barriers are still present. North African countries are not only isolated from each other, they are also cut off from the rest of the world, and constitute one of the less integrated zones in the global trade area.

One can instinctively blame the high tariffs for this lack of integration. However, recent findings in the trade literature suggest that this is maybe only one part of the explanation. Always more liberalized international trade has led economists to rethink the determinants of such sub-optimal trade integrations. Non-tariff measures and trade facilitation policies have recently occupied a large place in economic theory. The message from the report companion of the Logistic Performance Index is clear: "Connecting to

⁴ Published as Lapeyronie H., Maurel M., Meunier B. (2018) "Impact of hard and soft infrastructure: evidence from North Africa and CEECs", chap 21 in van Bergeijk Peter A.G., Moons Selwyn J.V. (eds.), *Research Handbook on Economic Diplomacy*, pp. 347–372.

Compete”. With the production chain being spread over countries, it is now necessary to have strong and reliable trade facilitation infrastructures and services. Insufficient political investment in this area may indeed lead to the exclusion from some global production networks requiring a reactive supply chain.

Globally, according to the Logistic Performance Index ranking, the least performing countries are landlocked or in civil war. North African countries may well have access to the sea, but they under-perform in terms of trade facilitation. Comparable countries in Central and Eastern Europe have been able to create efficient trade infrastructures, and to restructure their trade dramatically after the fall of the Berlin Wall on 9 November 1989 and the dissolution of the Soviet Bloc. Western countries and firms entered Eastern markets; inversely Western markets are nowadays more open for Eastern Goods. Trade reorientation is one of Nauro Campos and Fabrizio Corricelli’s (2002) “magnificent seven stylized facts of ten years of transition”. Simultaneously with this economical reorientation, one witnessed the births of new diplomatic relationships, while older ties were renewed.

Export promotion often is made explicit as one of the objectives of a foreign diplomatic mission. For example, France explicitly sees the (future) role for embassies differing according to the level of development of the bilateral partner, where, especially in the case of emerging economies, “il faut faire fructifier les relations”⁵. Andrew Rose (2007) computed the impact of foreign missions on exports using a cross-section of 22 big exporters and found a small, but positive significant effect of more foreign permanent representations on unilateral exports. Afman and Maurel (2010) who built on the Rose model to consider trade between Organisation for Economic Co-operation and

⁵ http://www.diplomatie.gouv.fr/fr/le-ministere-et-son-reseau/metiers-de-la-diplomatie/metiers-et-services/#so_2.

Development (OECD) and transition countries find that opening an embassy is equivalent to an ad valorem tariff reduction of 2–8 percent. This chapter takes an identified comparative approach with defined geographical limits, focusing on trade in a sample of North African countries, transition economies and their main trade partners. Our sample intends to reflect a region with a specific political and judiciary status comprising countries in Eastern Europe that have a vocation to integrate the EU and North Africa which is part of the near European neighbourhood. There are two reasons for this choice. First, the big trade reorientation that took place in the last decennium of the twentieth century could shed important light on the determinants of regional integration. Second, European transition countries have been perceived as diverting trade from the historical older EU partners of the Mediterranean Sea. From a policy point of view, it is interesting to see whether countries, which “stayed out” diplomatically, and lag behind in the quality of their logistical infrastructure and institutions have profited less from the potential export opportunities and have been more exposed to this trade diversion effect. We consider logistics and diplomacy as aspects of the regions and variables of interest which we proceed to examine. From a methodological point of view, our research is inspired by a recent paper of Hanousek and Kočenda (2014). The panel structure of the dataset allows us to include pair-wise fixed effects and control for country-pair heterogeneity in the bilateral relationship, or for time-invariant typical characteristics between different pairs of countries. This overcomes the problem of biased estimates due to omitted variables, as argued by Cheng and Wall (2005). We add foreign missions of the importing country in the exporting country and vice versa as our variables of interest in addition to the trade facilitation variables (since this type of diplomatic relation could facilitate imports). In a comparative way, we emphasize also the effect of Doing Business and logistical infrastructure facilities in opening new trade ties and magnifying diplomatic action. In sum, our empirical contribution to the issue of foreign

missions and exports is twofold. We compare missing trade opportunities due to lack of foreign missions or due to the poor quality of soft and hard infrastructure aiming at facilitating business in two regions that constitute the EU neighbouring. Our findings echo a recent publication of de Melo and Wagner (2016), who calculate that the effect of improving trade facilitation indicators, of reducing the time spent on customs, the number of documents needed to trade and so on is substantial. We apply a method of analysis exploiting the panel structure of the data, which corrects for the heterogeneity and simultaneity bias and focuses on the determinants of country pair-specific fixed effects. The chapter is organized as follows. Our first part presents a review of the literature. We then proceed to discuss the methodology and data and provide comments on the results. Our last part concludes.

LITERATURE REVIEW

The trading literature builds on factors which facilitate the trading network and increase the performance of trading flows. When analysing OECD countries, Wang et al. (2010) concludes that geographical distance is the most important determinant of recent trade flows in terms of the magnitude followed by research and development stock, gross domestic product (GDP) level and finally foreign direct investment. More recent research also focuses on new determinants such as the beneficial effects of soft and hard infrastructure as well as the trade direction to determine the impacts of trading from developed countries to less developed ones and vice versa. Association and trade agreements were found to have a positive and significant impact on trade flows between transformation and EU countries (Caporale et al., 2009; Egger et al., 2011). Second, despite existing economic differences among countries, the new EU members quickly became an important part of the EU-wide manufacturing and distribution network (Kaminski and Ng, 2005). The EU is a functioning free trade area and strong tariff reduction in the EU has been shown to be trade-creating (Eicher and Henn, 2011). New EU members were accepted to the free trade area after their accession in 2004 and 2007 but, as argued earlier, they were already removing trade barriers before and during the accession process (Egger et al., 2011).

A traditional topic in the literature has been the focus on tariff reductions, which are a core side effect of economic liberalization. While one can argue that these effects are marginal in modern economies, the research of Hoekman and Nicita (2011) has shown that tariff barriers still matter, especially for the agricultural sector and the developing countries. The authors also demonstrate that economic policies linked to trade facilitation have to be given more importance in their role of determining trade flows, as more gains can be made

by improving logistic performances. Similarly, Arvis et al. (2013) find that trade facilitation policies, and especially the logistic side, account for a very large part of trade costs, in a comparable order of size to those due to geography.

One of the most important issues is the role of trade costs within global production networks (GPNs). Hanson et al. (2005) analyse the role of trade costs in US multinational firms' decision to export intermediate goods to their affiliates abroad for processing. The authors find that affiliate demand for imported inputs is higher in host countries with lower trade costs. Another approach consists in employing Input-Output tables. Hummels et al. (2001) compute the degree of vertical specialization for OECD countries, showing that 30–40 percent of exports (OECD and World) are imputable to vertical specialization. They argue that small decreases in trade barriers provide strong incentives for vertical specialization. Using a gravity model and distinguishing trade in final goods from trade in parts and components, Saslavsky and Shepherd (2012) present evidence that trade in the latter within international production networks is more sensitive to logistics performance than is trade in final goods. The difference between the two effects is quantitatively significant: the semi-elasticity of trade with respect to importer logistics performance is about 45 percent larger for parts in components than for final goods. Recent research therefore aims at understanding the mechanisms of fragmentation in production networks, which is also one objective of this chapter.

Trade literature focusing specifically on the North African region is relatively scarce. Research typically focuses on the non-Euro Mediterranean area as a whole, analysing the trade volume effects resulting from tariff liberalization and trade preferences. Empirical studies (Persson and Wilhelmsson, 2006) have shown that Mediterranean countries benefiting from the EU preference schemes increased their exports to the EU with a more pronounced effect in recent years (Peridy, 2005). However, results also indicate that

exports from the region have actually increased less than their exports to the rest of the world (de Wulf and Maliszewska, 2009). Furthermore, Amurgo-Pacheco (2006) and Bensassi (2010) point out that EU trade preferences have also contributed to a higher degree of export diversification from these countries. Overall, the effects on exports of new products remain relatively small and only account for a minor share of total export expansion. They do not affect a wide range of sectors (Amurgo-Pacheco and Pierola, 2008). Building on this literature, Bourdet and Persson (2011) show that deeper integration in the form of trade facilitation specifically improved and simplified trade procedures aimed at reducing time to export lead to rising volumes of trade as well as export diversification. A specific focus on North Africa has been given in an unpublished World Bank Report assessing the restrictions imposed by the high trade costs in the region and sheds light on the sizable lack of investment in trade facilitation in North Africa compared to other competitive countries. The lack of cooperation in the region can be held responsible for this situation. The research carried out by Lapeyronie (2015) provides empirical evidence supporting the determinant role played by trade facilitation policies on bilateral exports and therefore its positive effects for the region's integration in the international trading network. The author has shown that insufficient investment in trade facilitation can be responsible for the exclusion of the entire region from international trade.

Regarding the countries from Central and Eastern Europe, a key element is the economic transformation and radical liberalization of foreign trade in ex-Soviet Bloc countries following the collapse of the Iron Curtain. The role played by foreign trade has been constantly emphasized by the literature in the 1990s, starting from Drábek and Smith (1995), who point out the full-scale geographical reorientation of international trade from East to West. They highlight how trade with the EU has been associated with relatively little change in the structure of that trade, which suggests that policy should be oriented

towards facilitating rather than slowing industrial adjustment. Brenton et al. (1998) empirically demonstrate how regional economic integration in the region provides an important stimulus to foreign direct investment. Later, Gross and Steinherr (2004) show that the share of exports to industrialized countries from Poland, Hungary and Czechoslovakia increased significantly from 20/30 percent to 50/60 percent between 1989 and 1992. Some of the most recent results covering the period under research (2005–12) are in Frensch et al. (2012, 2013), who demonstrate that East-West European trade in final goods as well as in parts and components, measured as wages or GDP per capita, is driven by supply-side country differences relative to the world average.

A last dimension that deviates from the purely economic analysis is to integrate diplomatic (or political) factors and their effects on the trading mechanism and economic integration. Economic diplomacy comprises the activities of a country's government facilities (embassies and consulates) to facilitate and stimulate international trade and investment through the use of national and international networks. Diplomats have the role of supplying "unique, reliable and impartial access to information such as through the global embassy network and other government channels and contact, which become available through the government's very long term and non-commercial attachment to overseas markets" (Harris and Li, 2005, p. 74). By doing so, economic diplomacy leads to lower transaction costs and a more efficient allocation of capital, thereby facilitating international trade between countries. When analysing the evolution of diplomatic relationships in the modern economic world, Saner and Yiu (2003) note the evolution of the sphere of international relations. In Central and Eastern Europe, diplomatic relationships were particularly relevant after the dissolution of the Soviet Bloc, which brought new economic and political ties between countries. However, the fall in communication costs in the last decade has made information about foreign countries

become quickly and cheaply available through alternative sources. The general consensus is that resources invested in the Foreign Service have now shifted to promoting exports, playing a key role in developing and maintaining export markets. The topic therefore becomes particularly relevant to analyse in the trade literature context, given that export promotion is often made explicit as one of the objectives of a foreign diplomatic mission. While economists have traditionally been sceptical of their benefits, diplomatic relationships are increasingly being recognized as an instrument that can be used to analyse the dynamics of trade barriers. The macroeconomic effects of foreign missions on exports were first analysed by Rose (2007) who found a positive significant effect of more foreign permanent representations on unilateral exports. In particular, each additional consulate is associated with slightly higher exports in a non-linear way with the first foreign mission having a larger effect on exports than successive missions. In the context of post-transition trade reorientation, these diplomatic relations were further investigated by Afman and Maurel (2010) who built on the Rose model to consider trade between OECD and transition countries. They conclude that “economic diplomacy” is indeed associated with higher exports, suggesting that export promotion through the creation of permanent missions is effective where trade with transition countries is concerned. Using Anderson’s and van Wincoop’s estimates for the elasticity of substitution, they find that opening an embassy is equivalent to an ad valorem tariff reduction of 2–8 percent. These results contrast with the view that the pattern of international trade is increasingly determined by macroeconomic factors and that there is no role left for diplomacy. In another study, Kang (2011) reports that a 10 percent increase in the budget of export promotion units in embassies increases exports by 2–6 percent. Further research undertaken by van Bergeijk et al. (2011), who investigated the contribution of different forms of diplomatic representation to the bilateral trade flows (both exports and imports) of a group of 63 countries, shows a positive and

highly significant effects for embassies. However, the authors find mixed results for the other forms of representation, which leads them to the conclusion that there is a different impact on trade depending on the type of diplomatic representation analysed. In their view, embassies have a larger impact on trade than consulates, while honorary consulates on average do not add value (van Bergeijk et al., 2011). Through a meta-analysis of 32 primary studies in the aggregate, Moons and van Bergeijk (2017) conclude that studies using a variable which lumps embassies and consulates into one indicator miss the point that these instruments differ significantly and should thus be included as separate instruments in future research. Their study supports a positive and significant effect of economic diplomacy, with the exception of state visits. Another point of interest has been the difference of the impact of diplomacy at different levels of economic development. This is especially problematic in the case of developing countries because published statistics and other sources are less reliable for those markets. Along those lines, Yakop and van Bergeijk (2011) demonstrate that diplomatic representation via embassies and consulates is not a relevant trade-enhancing factor for trade within the OECD, but that it is significant in bilateral trade relationships of developing countries. The careful selection of variables and country groups as highlighted by the literature is therefore an importance aspect to take into consideration when analysing the relationship of diplomacy and international trade.

DATA AND METHODOLOGY

The Gravity Model

Empirical studies of foreign trade flows typically implement the gravity equation which specifies that bilateral trade flows are determined by the economic sizes of and the bilateral distance between the two countries (see Tinbergen, 1962; Poyhonen, 1963). Trade patterns have classically been analysed in the context of gravity models, introduced by Anderson (1979) as a workhorse for more than three decades. Anderson and van Wincoop (2003) later introduced fixed effects that tackled the omitted variable bias common when analysing trading links and the extent of trade between countries by substituting for imperfect knowledge of the factors that are potentially correlated with the extent of the analysed bilateral trade as well as with explanatory variables. Country-pair fixed effects thus allow the capturing influences that are difficult to quantify but that nevertheless affect the pattern and extent of bilateral trade. In addition, research which deviates from the traditional gravity models, like that undertaken by Hanousek and Kočenda (2014), have shown to be in line with the underlying theoretical foundations of the literature. In their study, the authors derive country-pair fixed effects over all possible pairs of export-import partners and – in a second stage – proceed to relate fixed effects to a set of influential factors. Hanousek and Kočenda's methodology has two major advantages. The first one is that it allows us to properly estimate our trade facilitation indicators by taking into account the low variation over time. The second one is that the use of fixed effects in the first step can potentially cope for some endogeneity issues such as missing variables and unobserved heterogeneity that are often left aside in the trade facilitation literature.

First, we regress the log of the bilateral exports of our area on a bunch of fixed effects:

$$\begin{aligned} \log Exports(G)_{ij,t} &= \sum_{i=1}^N \sum_{t=1}^T \delta_{i,t} a_i \times I_t + \sum_{j=1}^N \sum_{t=1}^T \gamma_{j,t} a_j \times I_t + \sum_{i=1}^N \sum_{j=1}^N \mu_{ij} a_{ij} + \sum_{t=1}^T \beta_t I_t + \varepsilon_{ij,t} \end{aligned}$$

In the above equation, $\log Exports$ represents all the trade pairs in our sample according to the classification of goods that we describe in our data section. The coefficient $\delta_{i,t}$ is associated with the exporter-time fixed effects and $\gamma_{j,t}$ to the importer-time ones. Similarly, μ_{ij} correspond to the country-pair fixed effects while β_t is related to the time fixed effects. We take out the estimated country-pair fixed effects $\hat{\mu}_{ij}$ which is supposed to have absorbed the effect of all time-invariant regressors. In equation (2.2) we regress it on a set x_{ij} of time-invariant factors.

$$\hat{\mu}_{ij} = \sum_{i=1}^N \sum_{j=1}^N \alpha_{ij} x_{ij} + u_{ij} \quad (2.2)$$

Time-invariant Gravity Factors

Our trade data are taken from the BACI database (Base pour l'analyse du commerce international), whose specificity is to improve the COMTRADE database where values associated with the same bilateral flow might differ across the importer and exporter declarations. This dataset covers more than 200 countries over almost 5000 products (6-digit HS classification) between 1994 and 2013. We keep only the countries of our area of interest, North Africa and CEECs over the period 2005–12. We aggregate data up to three broad categories of goods according to the BEC classification, namely, “Primary goods”, “Parts and components” and “Capital goods”. Being located at different stages of the world supply chain those goods are expected to have different sensitivities (degrees of response) to variations in trade facilitation infrastructures, Doing Business variables, as well as soft

infrastructure like diplomatic missions. The dataset reaches a maximum of “1681” country pairs.

Mimicking the existing literature, we borrow the most commonly used gravity control variables from the *Centre d'études prospectives et d'informations internationales* (CEPII) gravity database:

- the population-weighted distance in kilometres
- a dummy contiguity equal to the unity if two countries are sharing a common border
- a dummy common language equal to the unity if two countries are sharing an official language
- a dummy common legal origin equal to the unity if two countries are sharing a legal system based on the same legal foundations (the English legal system has often been considered as easing trade relationships compared to the French one).

In addition, we built “regional dummies” in order to control for any non-included missing factors that would have explained the differences in trade integration that we observe.

We therefore include a dummy EU15 equal to the unity if both countries were already EU members when the 2004 enlargement towards the EAST occurred. A dummy variable CEECs equal to the unity if both countries are considered as part of the Central and Eastern European Countries (CEECs). We include an OECD dummy for the group of countries comprising Albania, Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania, the Slovak Republic, Slovenia, and the three Baltic States: Estonia, Latvia and Lithuania. A dummy North Africa is equal to one if both countries are part of North Africa, which comprises Algeria, Egypt, Libya, Mauritania, Morocco, Tunisia and Sudan.

We use the population to proxy for the mass variables in place of the classical GDP measure. Hanousek and Kočenda (2014) argue that population sizes are better than income-based indicators to account for the fact that bigger countries trade proportionally less.

Trade Facilitation Indicators

We rely upon two groups of trade facilitation indicators that are produced by the World Bank. The first is the Doing Business dataset “Trading across the Border” component which measures the direct (monetary) cost and fees associated with the export and import of a 20-foot container but also to the trade frictions linked to the action of trading abroad. More precisely, we resort to the costs related to export and import merchandise in US\$, the number of legal documents which are required for exporting and importing and the average time needed to ship a container for each country in our sample. Our second group of trade facilitation indicators is borrowed from the Logistic Performance Index (LPI). It aims at measuring the quality of the logistic, infrastructures and services related to the trading activities. Contrary to the Doing Business, the LPI is available in only three years: 2007, 2010 and 2012. According to the World Bank website, the LPI components are chosen based on recent theoretical and empirical research and on the practical experience of logistics professionals involved in international freight forwarding. They include the efficiency of customs and border management clearance, the quality of trade and transport infrastructure, the competence and quality of logistics services—trucking, forwarding, and customs brokerage, the ability to track and trace consignments and the frequency with which shipments reach consignees within scheduled or expected delivery times.

Overall, trade facilitation is a broad and generic term for which plenty of things can be applied that are more or less closely related to the action of facilitating trade. While it is

hard to define precisely what trade facilitation is, Doing Business and the LPI allow us to distinguish two dimensions. Doing Business is directly related to what happen inside a country at the firm level, from a burdensome regulatory environment to insufficient institutional capacities that could prevent firms from trading with other countries. The LPI ranks the countries according to their efficiency in the soft and hard infrastructures⁶. As such, it is a measure of countries' competitiveness. This distinction is clearly written in the Doing Business 2015 report (p. 18) as follows:

Thus, through these indicators Doing Business provides a narrow perspective on the infrastructure challenges that firms face, particularly in the developing world. It does not address the extent to which inadequate roads, rail, ports and communications may add to firms' costs and undermine competitiveness (except to the extent that the trading across borders indicators indirectly measure the quality of ports and roads).

Finally, it is worth noticing than these variables are not perfect. In our case, an important issue is that trade facilitation indicators do not vary per products or per sectors. Indeed, it seems obvious that some goods need specific procedures or/and infrastructures while other do not. In the case, for example, of perishable goods, the cost linked to the delays should be higher compared to the cost experienced by manufactured goods. Another problem is that these variables are highly correlated, which calls for a separate estimation in order to avoid multicollinearity problems.

⁶ We borrow this term from Portugal-Perez and Wilson (2009) who make the distinction between tangible trade infrastructures (hard) such as ports, roads and non-tangible infrastructures (soft) such as road transport companies.

Diplomatic Variables

In order to measure the impact of diplomacy on trade, we look at bilateral diplomatic representation. Broadly speaking, we can define a diplomatic representation as the appointment of an official from another country in order to promote and defend its national interests.

From an economic perspective, foreign missions are acknowledged to play an important role in trade promotion, a stronger diplomatic presence through higher diplomatic representation levels being associated with more trade. In modern diplomacy, we can distinguish various levels of diplomatic representation: at the lowest extreme, the *Chargé d'affaires* is a permanent or temporally diplomatic agent appointed if diplomatic relationships are not deep enough to motivate the creation of an embassy; at the highest extreme, the Ambassador represents the highest ranking level in modern diplomacy.

We construct our variables from the Correlates of War project⁷, an academic database of international relations data. In the diplomatic exchange dataset, the authors have created a categorical variable with three levels: *Chargé d'affaires*, Minister and Ambassador. As Minister does not appear in our sample, we have consequently reshaped this variable in four distinct dummies. A first one called *Chargé d'affaires* $I \rightarrow X$ is equal to one if a *Chargé d'affaires* is appointed by the importing country in the exporting country. Symmetrically, *Chargé d'affaires* $X \rightarrow I$ is equal to one if the *Chargé d'affaires* is sent by the exporting country in the importing country. Second, we have created a dummy Ambassador $I \rightarrow X$ equal to one if there is an Ambassador appointed by the importing

⁷ The Correlates of War is an academic database project initiated by researchers from the University of Michigan which specializes in variables linked to the incidence and extent of inter-state and extra-systemic war (accessed February 2016 at <http://www.correlatesofwar.org/>).

country in the exporting country. Conversely, a dummy Ambassador $X \rightarrow I$ is equal to one if the Ambassador in the importing country comes from the exporting country.

An important thing to notice is that the data are available only until 2005. Indeed, the Correlates of War project stopped the actualization of the diplomatic exchange dataset in 2006. As there is, to our knowledge, no other free and detailed data on diplomatic relationship, we keep the last entry (2005) for our study. Another essential point is that the *Chargé d'affaires* variable can, in some cases, represent the transition from an Ambassador to a lowest level of diplomatic representation (mostly *Chargé d'affaires*). This only happens when an Ambassador is “expelled, recalled, or withdrawn”. Even if the authors do not specify the exact nature of the variable, we can assume that the shutting down of an embassy is a sufficiently rare event to ignore this possibility. In all cases, the *Chargé d'affaires* can be considered as the lowest degree of diplomatic representation.

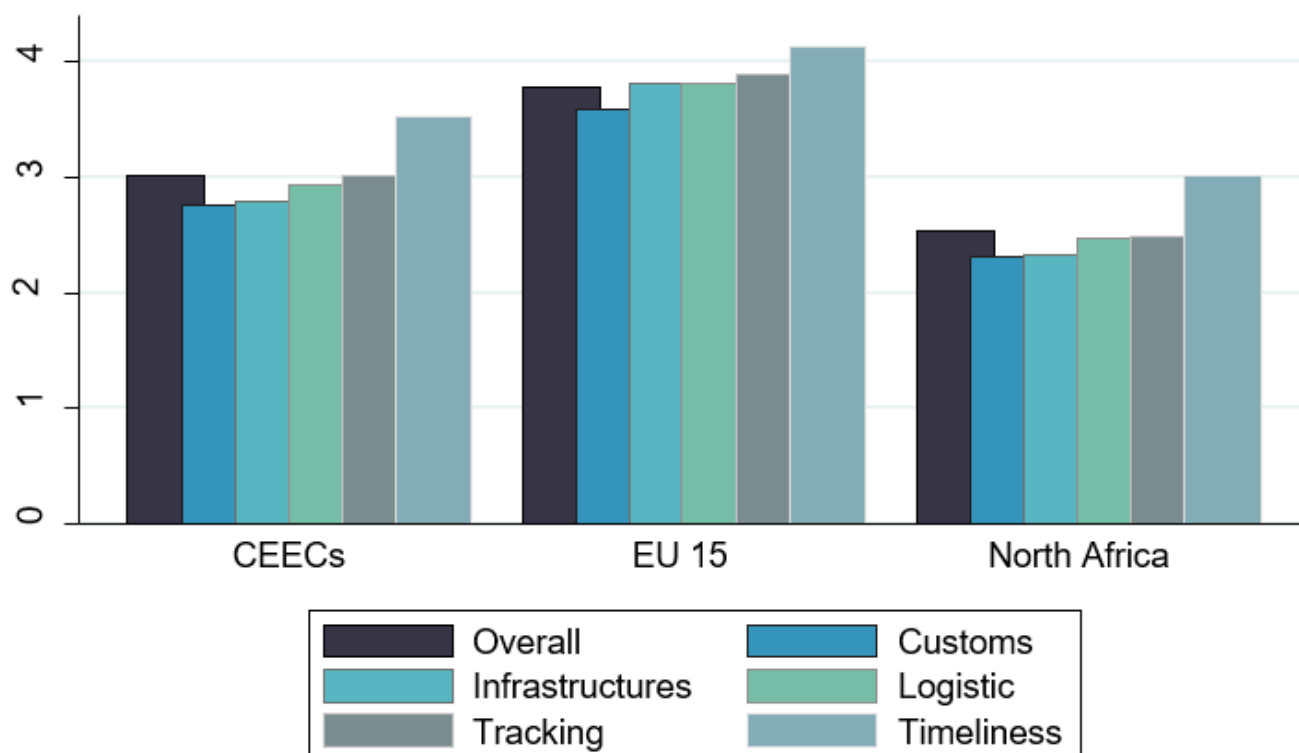
In addition to these limitations, we must address the endogenous nature of our data. In the area of diplomacy, countries are likely to set up an embassy in countries with which they already trade a lot. If this is the case, endogeneity will arise due to the potential correlation between our diplomatic variables and the error term. But countries can also have the incentive to set up an embassy in countries with which they share cultural proximity, historical ties, or whatever. If we omit to control for these unobserved characteristics, we bear the risk of getting biased coefficients. The literature on diplomacy offers a solution to solve these issues. As Rose (2007), we could resort to instrumental variables (IVs). However, as emphasized in Baier and Bergstrand (2007), finding good instruments is difficult, while exploiting the panel structure of the trade data to introduce bilateral fixed effects but also country-and-time effects allows us to take care of the endogeneity issues discussed above.

The methodology we follow in this chapter takes advantage of the time-invariant nature of our variable of interest. As previously mentioned, Hanoucek and Kočenda separately estimate the time varying and the time-invariant factors of their gravity equation in order to prevent endogeneity issues. This process allows them to introduce a complete set of fixed effect in the first stage, keeping the explanatory power of the time-invariant factors for the second stage. Diplomatic relationships having little variation through time, they are introduced in the second stage of the methodology. Finally, it is noteworthy that the diplomatic and trade facilitation variables might experience high levels of collinearity. While wealthy countries tend to have good infrastructures and more embassies on average, it is not clear, however, that both are directly related. For example, France is one of the countries having the largest number of diplomatic missions and yet it does not outperform the other developed countries in term of trade infrastructures (according to the LPI and Doing Business rankings). In sum, high levels of diplomacy do not imply high levels of trade infrastructures.

Analysing Trade Facilitation Performances in Our Area of Study

Trade facilitation indicators display strong disparities across the regions of our area of study. First, the LPI and its components that range from 0 to a maximum of 5 show clearly that North Africa lags behind in terms of logistic competitiveness. If we focus exclusively on the overall indicator, which is the mean of five sub-components, we see that EU15 dominates (as expected) the area. Despite strong improvements over the last two decades, CEECs are still lagging behind the standards of the most developed countries (Figure 2.1).

Figure 2.1. LPI and its components averaged over the period 2006-2012 – by Areas



The Doing Business variables show up similar patterns. Obviously, the EU15 countries record the best performances in these trade facilitation measures (which are correlated with GDP per capita). We must notice though the discrepancies between North Africa and the CEECs. It is striking to see how much North Africa is outperformed by the CEECs (Figures 2.2–2.4).

In term of diplomacy, North Africa is obviously less integrated in the area than the CEECs. The diplomatic snapshot graph shows that countries in North Africa have no diplomatic representation in CEECs countries in the majority of cases, while CEECs opened foreign missions in North Africa. The same pattern emerges if one focuses on diplomatic representation of both regions in the EU15, which is the main trade partner.

Figure 2.2. Doing business – Costs averaged over the period 2006-2012 – by Areas

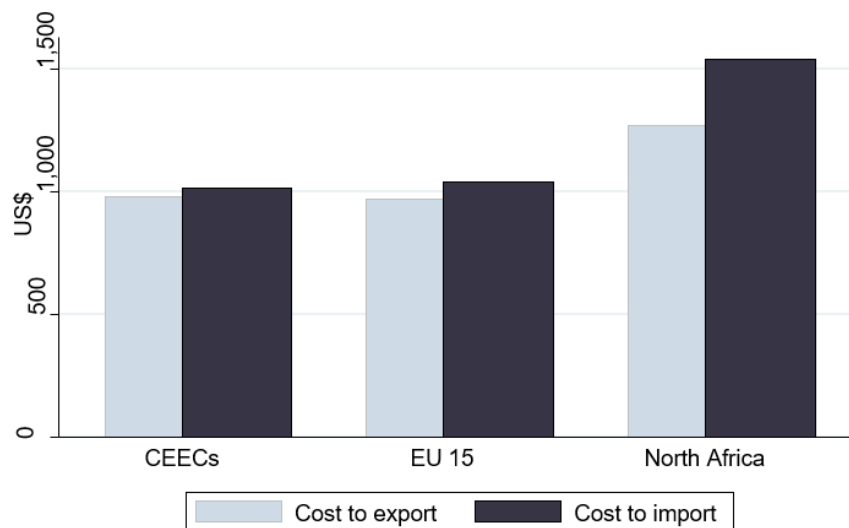


Figure 2.3. Doing business – Documents averaged over the period 2006-2012 – by Areas

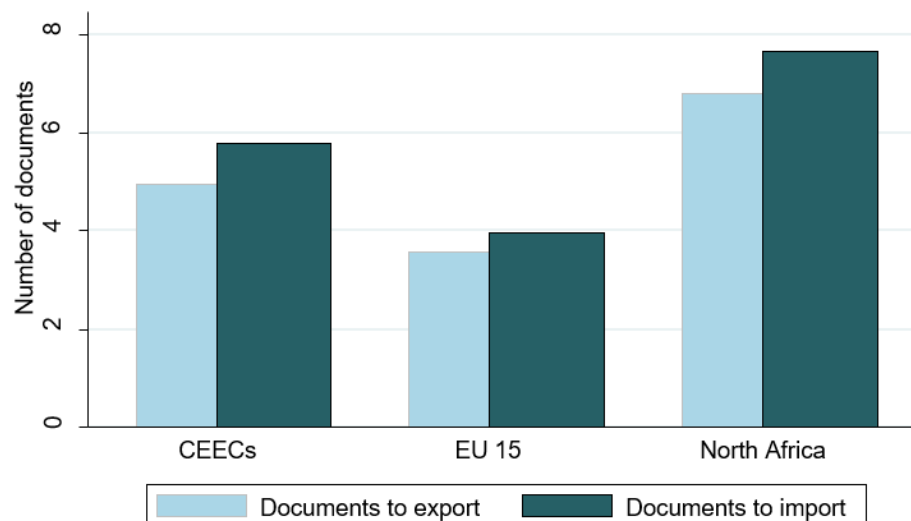


Figure 2.4. Doing business – Time averaged over the period 2006-2012 – by Areas

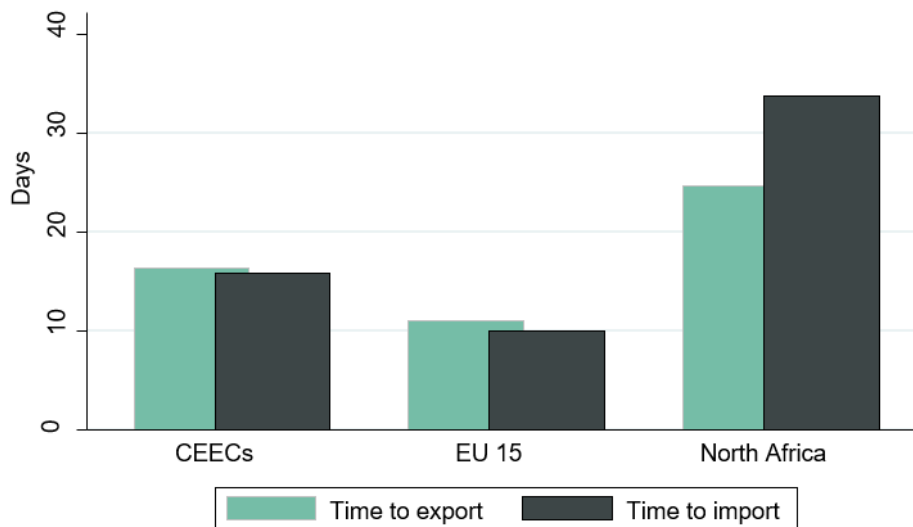
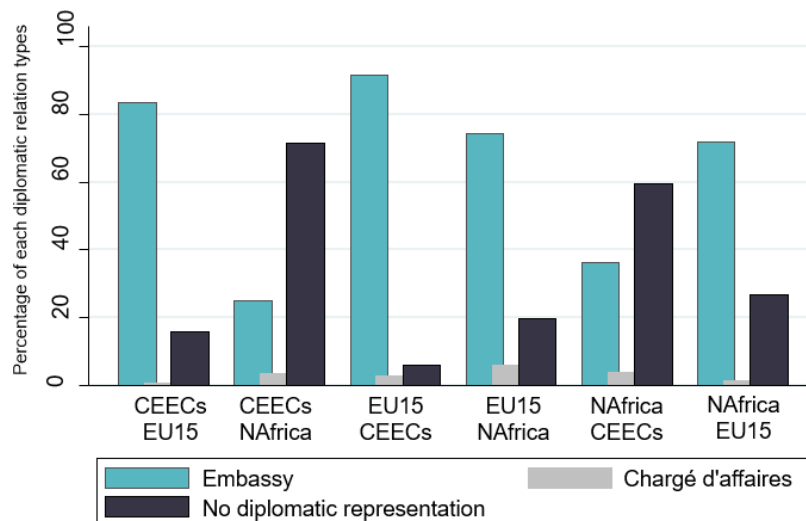


Figure 2.5. Diplomatic snapshot in 2005



From Figure 2.5, we observe the low number of *Chargés d'affaires* in our database. This is mainly due to the nature of this specific diplomatic title. Indeed, according to the Correlated of War codebook, *Chargés d'affaires* can be appointed when two countries do not need a higher level of diplomatic exchanges but it can also represent a transition status towards stronger or lower diplomatic ties. In that last case, *Chargés d'affaires* are

temporary agents representing the first step towards the appointment of an Ambassador or, on the contrary, the end of “diplomatic exchanges” at the embassy level (in case of a diplomatic crisis for example).

Despite its low occurrence in our database, we included the *Chargé d'affaires* variable in order to account for the transitive state between no diplomatic relationships and bilateral embassies. The main objective is that we want to avoid a potential missing variable in the case where *Chargé d'affaires* would be favoured by a certain type of country. This is indeed a cheaper way to set diplomatic relationships. The second is that this variable offers us a useful counterfactual between two extreme states of diplomacy: embassy and no official diplomatic relationships.

Also note that “no diplomatic relationships” does not mean that bilateral relationships are damaged. Either both countries actually do not have diplomatic exchanges or they find other ways to have diplomatic ties, without any types of representation. Considering the countries in our database, we may think that supranational institutions can in a way proxy the establishment of a diplomatic representation between countries.

RESULTS

Tables 2.1 and 2.2 examine the relationship between bilateral export fixed effects and LPI (Table 2.1) or Doing Business (Table 2.2) as well as diplomatic representation levels at the total trade level. Looking at the control variables linked to cultural and geographic proximity between the countries, we note that distance is significant and negative across all regressions, as expected in the standard trade theory: the trade between two countries is negatively correlated with the cost of trading, and the respective cost is positively correlated with the distance between the two countries. It follows that for any country in the world it should normally be cheaper to exchange goods with its neighbours than with distant partners and consequently to trade more with countries with which it shares a common border. However, this is not always the case and recent studies have proved that the exchanges between neighbours in 2003 represented only 25 percent of total trade (Piana, 2006). As shown by Arvis et al. (2013), it is more expensive for Tunisia to trade manufactured goods with Algeria than with France, while trading agricultural goods between Algeria and Morocco is more than twice as expensive as between Algeria and Spain. This is the case in our sample of countries, where the common border variable is not significant. Sharing a common language is unexpectedly found to not always have a positive impact on export promotion across all regressions.

In Table 2.1, a common legal origin between the two trading countries is significant and positive across all regressions. The EU15 and North Africa dummies serve at controlling for any non-included missing factors to explain residual differences in trade integration, which explains why their sign might switch from negative (Table 2.1) to positive (Table 2.2), depending on the variables that are included in the specification, LPI or Doing Business. In Table 2.1 we introduce the variables linked to trade facilitation.

Looking at the results, the LPI estimates are robust and equally significant across all specifications. They are positively signed and their magnitude suggests a strong effect of logistic performance indices on the promotion of exports. This is the expected result and confirms the importance of the quality of trading activities in promoting the level of exports, be it the quality of the logistic, of infrastructures or services related to the trading activities. Table 2.2 displays the results of the same equation with LPI being replaced by Doing Business variables. The associated coefficients are now negative, indicating that a reduction of the costs incurred for importing or exporting improves the bilateral trade fixed effect. Looking at our second set of variables of interest, the diplomatic representation variables remain significant and positive across the specifications, implying that the Foreign Service is acting as a stimulant for exports. We note that having a *Chargé d'affaires* does not influence the level of the bilateral trade effect, while having an Ambassador matters, with a diplomatic representation of the importing country in the exporting country having an effect about one and half as big as having a representation in the importing country. As expected, our diplomatic variables seem to be influenced by the choice of the trade facilitation indicator. The inclusion of the LPI components provokes a sharp increase in the Ambassador coefficient. This suggests that the number of foreign missions and the logistic performances of a country are related. This is one thing that the reader should keep in mind while reading the results.

Tables 2.3 and 2.4 further investigate the relationship at the level of three categories of goods, namely, primary goods, parts and components, and capital goods. The control variables linked to cultural and geographic proximity display results similar to the results of the aggregate regressions; we observe that geographical distance, as measured through distance in kilometres (km), common border and geographical dummies, are significantly related to exports. However, primary goods are less sensitive to distance (negatively) but

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more sensitive to sharing a common border (positively, although this variable loses its significance for parts and components and capital goods). Speaking the same language increases bilateral trade fixed effect only for primary goods, not for the other two categories. It is interesting to note that having a common legal origin is significant most of the time.

Table 2.1. Diplomatic representation and LPI

	μ^{ij}	μ^{ij}	μ^{ij}	μ^{ij}	μ^{ij}	μ^{ij}
Inpop_X	0.799 *** (21.69)	0.878 *** (23.35)	0.782 *** (20.09)	0.741 *** (19.47)	0.800 *** (21.37)	0.650 *** (17.85)
Inpop_I	0.734 *** (19.93)	0.768 *** (20.42)	0.715 *** (18.36)	0.695 *** (18.26)	0.731 *** (19.55)	0.643 *** (17.69)
Indist	-1.640 *** (-18.42)	-1.789 *** (-19.88)	-1.623 *** (-17.25)	-1.827 *** (-19.79)	-1.656 *** (-18.33)	-1.524 *** (-17.11)
contiguity	0.188 (0.92)	0.0687 (0.33)	0.175 (0.81)	-0.0455 (-0.22)	0.135 (0.66)	0.281 (1.39)
commonleg	0.677 *** (5.67)	0.638 *** (5.29)	0.485 *** (3.87)	0.646 *** (5.2)	0.550 *** (4.57)	0.667 *** (5.6)
comlang_off	-0.385 (-1.40)	-0.413 (-1.49)	-0.359 (-1.24)	-0.225 (-0.79)	-0.270 (-0.98)	-0.157 (-0.58)
EU15	-0.642 *** (-3.83)	-0.479 ** (-2.86)	-0.323 (-1.84)	-0.478 ** (-2.75)	-0.611 *** (-3.57)	-0.418 * (-2.54)
CEECs	-0.264 (-1.29)	-0.291 (-1.41)	0.109 (0.5)	-0.446 * (-2.11)	-0.0369 (-0.18)	-0.706 *** (-3.47)
Nafrica	0.635 (1.54)	0.2 (0.49)	0.247 (0.57)	0.232 (0.55)	0.599 (1.43)	0.507 (1.24)
Chargé d'affaires i → X	0.277 (0.92)	0.248 (0.81)	0.313 (0.98)	0.266 (0.85)	0.356 (1.16)	0.376 (1.25)
Chargé d'affaires X → I	0.0578 (0.19)	0.0495 (0.16)	-0.0263 (-0.08)	0.0483 (0.15)	0.151 (0.49)	0.163 (0.54)
Ambassador I → X	0.652 *** (4.16)	0.797 *** (5.05)	0.824 *** (4.99)	0.741 *** (4.55)	0.721 *** (4.54)	0.689 *** (4.42)
Ambassador X → I	0.308 * (1.96)	0.405 * (2.57)	0.437 ** (2.65)	0.363 * (2.23)	0.352 * (2.21)	0.342 * (2.19)
LPIscore_X	10.94 *** (34.66)					
LPIscore_I	6.035 *** (19.17)					
Customs_X		8.830 *** (33.54)				
Customs_I		4.775 *** (18.19)				
Infrastructure_X			7.887 *** (30.11)			
Infrastructure_I			4.204 *** (16.09)			
LogisticsServices_X				9.197 *** (31.44)		
LogisticsServices_I				5.081 *** (17.44)		
Tracking_X					9.971 *** (33.53)	
Tracking_I					5.343 *** (18)	
Timeliness_X						13.90 *** (34.98)
Timeliness_I						7.259 *** (18.33)
Constant	-32.23 *** (-25.76)	-28.17 *** (-23.66)	-25.90 *** (-21.02)	-26.03 *** (-21.77)	-30.40 *** (-24.38)	-36.82 *** (-27.23)
N	1710	1710	1710	1710	1710	1710
adj. R2	0.78	0.775	0.755	0.763	0.774	0.781

Note: t statistics in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001. X stands for the exporting country side and I for the importing one. I → X means that a representative agent has been sent to the exporting country by the importing one.

Table 2.2. Diplomatic representation and Doing Business

	μ^{ij}	μ^{ij}	μ^{ij}	μ^{ij}	μ^{ij}	μ^{ij}
lnpop_X	0.671 *** (14.14)	0.749 *** (15.65)	0.920 *** (20.43)	1.081 *** (23.39)	0.889 *** (20.42)	0.806 *** (18.99)
lnpop_I	0.515 *** (10.87)	0.547 *** (11.43)	0.681 *** (15.14)	0.787 *** (17.05)	0.721 *** (16.55)	0.663 *** (15.64)
Indist	-1.760 *** (-15.31)	-1.680 *** (-14.79)	-1.613 *** (-15.42)	-1.617 *** (-15.84)	-1.875 *** (-18.25)	-1.965 *** (-19.20)
contiguity	0.0963 (0.37)	0.169 (0.65)	0.399 (1.67)	0.391 (1.67)	0.032 (0.14)	-0.0836 (-0.36)
commonleg	-0.401 ** (-2.71)	-0.314 * (-2.15)	-0.00121 (-0.01)	0.14 (1.04)	0.259 (1.91)	0.255 (1.89)
comlang_off	0.818 * (2.33)	0.891 ** (2.58)	-0.0658 (-0.20)	0.033 (0.11)	-0.154 (-0.49)	0.146 (0.47)
EU15	1.843 *** (9.68)	1.735 *** (9.22)	1.024 *** (5.7)	0.670 *** (3.73)	0.294 (1.57)	0.235 (1.25)
CEECs	-0.592 * (-2.23)	-0.697 ** (-2.67)	-0.100 (-0.42)	-0.207 (-0.88)	-0.843 *** (-3.57)	-0.928 *** (-3.96)
Nafrica	-3.724 *** (-7.42)	-3.641 *** (-7.37)	-1.995 *** (-4.29)	-1.393 ** (-3.03)	-1.557 *** (-3.39)	-1.933 *** (-4.27)
Chargé d'affaires i → X	0.950 * (2.44)	0.8488 (2.21)	0.585 (1.65)	0.532 (1.54)	0.673 (1.94)	0.521 (1.51)
Chargé d'affaires X → I	0.328 (0.84)	0.304 (0.79)	0.193 (0.55)	0.219 (0.63)	0.159 (0.46)	0.282 (0.82)
Ambassador I → X	1.946 *** (9.89)	1.819 *** (9.36)	1.441 *** (8)	1.197 *** (6.74)	1.340 *** (7.53)	1.343 *** (7.61)
Ambassador X → I	1.171 *** (5.95)	1.102 *** (5.67)	0.966 *** (5.36)	0.772 *** (4.35)	0.742 *** (4.17)	0.911 *** (5.17)
costexport_X	-1.279 *** (-7.28)					
costexport_I	-0.324 (-1.84)					
costimport_X		-1.803 *** (-10.46)				
costimport_I		-0.445 ** (-2.58)				
timeexport_X			-2.437 *** (-20.53)			
timeexport_I			-0.874 *** (-7.35)			
timeimport_X				-2.219 *** (-22.90)		
timeimport_I				-0.934 *** (-9.63)		
docexport_X					-3.505 *** (-21.54)	
docexport_I					-1.927 *** (-11.87)	
docimport_X						-3.370 *** (-22.78)
docimport_I						-1.413 *** (-9.57)
Constant	3.537 (1.77)	5.967 ** (3.21)	-6.235 *** (-5.60)	-10.62 *** (-9.58)	-4.362 *** (-3.97)	-1.876 (-1.69)
N	1710	1710	1710	1710	1710	1710
adj. R2	0.633	0.644	0.698	0.712	0.707	0.712

Note: t statistics in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001. X stands for the exporting country side and I for the importing one. I → X means that a representative agent has been sent to the exporting country by the importing one.

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The variables of geographical localization maintain the relationships found in the first set of regressions with the EU15 and North Africa dummies being statistically significant across all regression groups with positive and negative signs, respectively. We turn now to our primary interest, which is in the coefficients on the LPI and Doing Business variables. The results show that both clearly matter for trade performance: the exporter and importer LPIs both have coefficients that are positive and 1 percent statistically significant. This result is in line with other findings in the trade literature, such as Hoekman and Nicita (2011). More importantly, our estimates suggest that the elasticity of trade with respect to importer and exporter trade facilitation performance is stronger for parts and components than for either capital goods or primary goods. This makes sense as it implies that trade costs are more detrimental (logistic performance is more crucial) for parts and components which are traded between the suppliers and customers of a value-chain, and have to travel fast and efficiently to avoid any disturbance in the production chain.

Looking at our second set of variables of interest, we notice that the variable *Chargé d'affaires* is prominently insignificant across all regressions, indicating that the presence of a *Chargé d'affaires* alone has no impact on a country's export volume. In contrast, the presence of an Ambassador is highly significant and positive for both importer and exporter country in all regressions and across all categories of goods. These results point to an improvement of the trade volume when a high representative of foreign affairs is present in both the source and destination country. In particular when looking at the total trade volume, we note that the impact on export is higher if the Ambassador is present in the exporting country as opposed to the importing one. This result holds for the primary goods and part and components categories but is reversed for the capital goods category where it becomes more efficient to have an Ambassador in the importing country in order to promote exports.

Table 2.3.A. Diplomatic representation and LPI – Primary Goods

	(1)	(2)	(3)	(4)	(5)	(6)
Inpop_X	1.087 *** (14.26)	1.076 *** (14.02)	1.079 *** (14.12)	1.081 *** (14.16)	1.087 *** (14.25)	1.059 *** (13.88)
Inpop_I	0.796 *** (10.51)	0.839 *** (10.98)	0.797 *** (10.5)	0.795 *** (10.48)	0.776 *** (10.25)	0.731 *** (9.65)
Indist	-1.099 *** (-5.86)	-1.119 *** (-5.94)	-1.100 *** (-5.85)	-1.130 *** (-6.00)	-1.113 *** (-5.93)	-1.050 *** (-5.58)
contiguity	1.039 * (2.55)	1.023 * (2.51)	1.024 * (2.51)	1.000 * (2.45)	1.013 * (2.49)	1.083 ** (2.65)
commonleg	0.769 ** (3.1)	0.668 ** (2.7)	0.724 ** (2.93)	0.757 ** (3.06)	0.648 ** (2.63)	0.771 ** (3.1)
comlang_off	2.330 *** (4.37)	2.397 *** (4.48)	2.299 *** (4.29)	2.379 *** (4.46)	2.435 *** (4.57)	2.414 *** (4.53)
EU15	0.433 (1.3)	0.641 (1.96)	0.478 (1.45)	0.444 (1.35)	0.585 (1.75)	0.505 (1.55)
CEECs	-0.551 (-1.37)	-0.537 (-1.33)	-0.386 (-0.95)	-0.587 (-1.46)	-0.470 (-1.17)	-0.729 (-1.80)
Nafrica	-2.551 ** (-2.63)	-2.905 ** (-3.01)	-2.568 ** (-2.64)	-2.551 ** (-2.63)	-2.751 ** (-2.83)	-2.550 ** (-2.63)
Chargé d'affaires i → X	0.0137 (0.02)	0.0727 (0.11)	-0.130 (-0.19)	-0.0483 (-0.07)	0.129 (0.19)	0.0535 (0.08)
Chargé d'affaires X → I	-0.521 (-0.78)	-0.529 (-0.79)	-0.463 (-0.69)	-0.478 (-0.71)	-0.542 (-0.81)	-0.436 (-0.65)
Ambassador I → X	0.939 ** (2.86)	1.029 ** (3.14)	0.938 ** (2.86)	0.9 (2.73)	1.031 ** (3.14)	0.908 ** (2.76)
Ambassador X → I	1.000 ** (3.04)	1.098 *** (3.35)	1.067 ** (3.25)	1.009 ** (3.06)	1.062 ** (3.23)	1.030 ** (3.13)
LPIscore_X	1.07 (1.59)					
LPIscore_I	5.813 *** (8.7)					
Customs_X		0.277 (0.51)				
Customs_I		4.409 *** (8.16)				
Infrastructure_X			0.961 (1.79)			
Infrastructure_I			4.383 *** (8.27)			
LogisticsServices_X				1.115 (1.9)		
LogisticsServices_I				4.923 *** (8.48)		
Tracking_X					0.174 (0.28)	
Tracking_I					5.214 *** (8.33)	
Timeliness_X						1.6 (1.87)
Timeliness_I						7.156 *** (8.45)
Constant	-31.79 *** (-12.37)	-29.38 *** (-11.94)	-29.75 *** (-12.37)	-30.33 *** (-12.47)	-29.81 *** (-11.84)	-33.96 *** (-12.19)
N	1525	1525	1525	1525	1525	1525
adj. R2	0.456	0.454	0.453	0.454	0.456	0.454

Note: t statistics in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001. X stands for the exporting country side and I for the importing one. I → X means that a representative agent has been sent to the exporting country by the importing one.

Table 2.3.B. Diplomatic representation and LPI – Parts and Components

	(7)	(8)	(9)	(10)	(11)	(12)
lnpop_X	0.877 *** (25.14)	0.989 *** (27.19)	0.859 *** (23.52)	0.858 *** (24.01)	0.880 *** (24.95)	0.713 *** (20.56)
lnpop_I	0.690 *** (19.82)	0.727 *** (19.99)	0.675 *** (18.49)	0.679 *** (19.02)	0.686 *** (19.5)	0.601 *** (17.38)
Indist	-1.586 *** (-18.53)	-1.659 *** (-18.67)	-1.580 *** (-17.62)	-1.667 *** (-18.98)	-1.642 *** (-18.98)	-1.455 *** (-17.08)
contiguity	0.333 (1.78)	0.282 (1.45)	0.301 (1.53)	0.233 (1.21)	0.252 (1.33)	0.448 * (2.4)
commonleg	0.611 *** (5.37)	0.489 *** (4.16)	0.438 *** (3.7)	0.521 *** (4.48)	0.497 *** (4.35)	0.596 *** (5.27)
comlang_off	-0.546 * (-2.22)	-0.513 * (-2.01)	-0.572 * (-2.22)	-0.366 (-1.46)	-0.458 (-1.85)	-0.300 (-1.23)
EU15	-0.851 *** (-5.58)	-0.583 *** (-3.74)	-0.619 *** (-3.91)	-0.711 *** (-4.57)	-0.895 *** (-5.78)	-0.618 *** (-4.16)
CEECs	0.474 * (2.56)	0.508 ** (2.65)	0.909 *** (4.68)	0.385 * (2.03)	0.720 *** (3.85)	-0.00366 (-0.02)
Nafrica	-0.0578 (-0.13)	-0.577 (-1.24)	-0.289 (-0.61)	-0.201 (-0.43)	0.119 (0.26)	-0.122 (-0.27)
Chargé d'affaires i → X	0.297 (0.97)	0.328 (1.03)	0.286 (0.89)	0.318 (1.01)	0.376 (1.21)	0.428 (1.4)
Chargé d'affaires X → I	0.965 ** (3.14)	0.960 ** (3.01)	0.770 * (2.39)	0.935 ** (2.97)	1.011 ** (3.26)	1.182 *** (3.87)
Ambassador I → X	0.617 *** (4.08)	0.786 *** (5.03)	0.767 *** (4.85)	0.631 *** (4.07)	0.676 *** (4.43)	0.633 *** (4.21)
Ambassador X → I	0.679 *** (4.49)	0.783 *** (5.01)	0.788 *** (4.99)	0.676 *** (4.36)	0.679 *** (4.45)	0.692 *** (4.6)
LPIscore_X	12.44 *** (40.28)					
LPIscore_I	6.370 *** (20.81)	9.646 ***				
Customs_X		(37.29)				
Customs_I		4.827 *** (18.81)				
Infrastructure_X			9.395 *** (36.69)			
Infrastructure_I			4.638 *** (18.31)			
LogisticsServices_X				10.56 *** (38.38)		
LogisticsServices_I				5.303 *** (19.46)		
Tracking_X					11.48 *** (39.38)	
Tracking_I					6.001 *** (20.69)	
Timeliness_X						15.83 *** (40.74)
Timeliness_I						7.777 *** (20.22)
Constant	-35.91 *** (-30.38)	-31.78 *** (-27.09)	-29.57 *** (-25.58)	-31.10 *** (-27.15)	-34.18 *** (-29.24)	-41.40 *** (-32.56)
N	1544	1544	1544	1544	1544	1544
adj. R2	0.829	0.816	0.812	0.82	0.825	0.831

Note: t statistics in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001. X stands for the exporting country side and I for the importing one. I → X means that a representative agent has been sent to the exporting country by the importing one.

Table 2.3.C. Diplomatic representation and LPI – Capital goods

	(7)	(8)	(9)	(10)	(11)	(12)
Inpop_X	0.877 *** (25.14)	0.989 *** (27.19)	0.859 *** (23.52)	0.858 *** (24.01)	0.880 *** (24.95)	0.713 *** (20.56)
Inpop_I	0.690 *** (19.82)	0.727 *** (19.99)	0.675 *** (18.49)	0.679 *** (19.02)	0.686 *** (19.5)	0.601 *** (17.38)
Indist	-1.586 *** (-18.53)	-1.659 *** (-18.67)	-1.580 *** (-17.62)	-1.667 *** (-18.98)	-1.642 *** (-18.98)	-1.455 *** (-17.08)
contiguity	0.333 (1.78)	0.282 (1.45)	0.301 (1.53)	0.233 (1.21)	0.252 (1.33)	0.448 * (2.4)
commonleg	0.611 *** (5.37)	0.489 *** (4.16)	0.438 *** (3.7)	0.521 *** (4.48)	0.497 *** (4.35)	0.596 *** (5.27)
comlang_off	-0.546 * (-2.22)	-0.513 * (-2.01)	-0.572 * (-2.22)	-0.366 (-1.46)	-0.458 (-1.85)	-0.300 (-1.23)
EU15	-0.851 *** (-5.58)	-0.583 *** (-3.74)	-0.619 *** (-3.91)	-0.711 *** (-4.57)	-0.895 *** (-5.78)	-0.618 *** (-4.16)
CEECs	0.474 * (2.56)	0.508 ** (2.65)	0.909 *** (4.68)	0.385 * (2.03)	0.720 *** (3.85)	-0.00366 (-0.02)
Nafrica	-0.0578 (-0.13)	-0.577 (-1.24)	-0.289 (-0.61)	-0.201 (-0.43)	0.119 (0.26)	-0.122 (-0.27)
Chargé d'affaires i → X	0.297 (0.97)	0.328 (1.03)	0.286 (0.89)	0.318 (1.01)	0.376 (1.21)	0.428 (1.4)
Chargé d'affaires X → I	0.965 ** (3.14)	0.960 ** (3.01)	0.770 * (2.39)	0.935 ** (2.97)	1.011 ** (3.26)	1.182 *** (3.87)
Ambassador I → X	0.617 *** (4.08)	0.786 *** (5.03)	0.767 *** (4.85)	0.631 *** (4.07)	0.676 *** (4.43)	0.633 *** (4.21)
Ambassador X → I	0.679 *** (4.49)	0.783 *** (5.01)	0.788 *** (4.99)	0.676 *** (4.36)	0.679 *** (4.45)	0.692 *** (4.6)
LPIscore_X	12.44 *** (40.28)					
LPIscore_I	6.370 *** (20.81)	9.646 ***				
Customs_X		(37.29)				
Customs_I		4.827 *** (18.81)				
Infrastructure_X			9.395 *** (36.69)			
Infrastructure_I			4.638 *** (18.31)			
LogisticsServices_X				10.56 *** (38.38)		
LogisticsServices_I				5.303 *** (19.46)		
Tracking_X					11.48 *** (39.38)	
Tracking_I					6.001 *** (20.69)	
Timeliness_X						15.83 *** (40.74)
Timeliness_I						7.777 *** (20.22)
Constant	-35.91 *** (-30.38)	-31.78 *** (-27.09)	-29.57 *** (-25.58)	-31.10 *** (-27.15)	-34.18 *** (-29.24)	-41.40 *** (-32.56)
N	1544	1544	1544	1544	1544	1544
adj. R2	0.829	0.816	0.812	0.82	0.825	0.831

Note: t statistics in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001. X stands for the exporting country side and I for the importing one. I → X means that a representative agent has been sent to the exporting country by the importing one.

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Table 2.4.A. Diplomatic representation and Doing Business – Primary Goods

	(1)	(2)	(3)	(4)	(5)	(6)
lnpop_X	0.968 *** (12.57)	0.968 *** (12.41)	1.134 *** (14.52)	1.236 *** (15.23)	1.077 *** (13.65)	1.043 *** (13.38)
lnpop_I	0.796 *** (10.43)	0.820 *** (10.6)	0.965 *** (12.48)	1.096 *** (13.63)	0.918 *** (11.7)	0.866 *** (11.18)
Indist	-1.107 *** (-5.72)	-1.087 *** (-5.66)	-1.122 *** (-5.97)	-1.138 *** (-6.09)	-1.143 *** (-6.01)	-1.141 *** (-5.98)
contiguity	1.060 * (2.55)	1.072 * (2.57)	1.223 ** (2.99)	1.208 ** (2.98)	1.031 * (2.5)	1.012 * (2.45)
commonleg	0.28 (1.17)	0.311 (1.29)	0.805 *** (3.32)	0.944 *** (3.89)	0.651 ** (2.64)	0.575 * (2.33)
comlang_off	2.829 *** (5.24)	2.851 *** (5.28)	2.006 *** (3.73)	2.090 *** (3.94)	2.348 *** (4.34)	2.551 *** (4.74)
EU15	1.426 *** (4.85)	1.403 *** (4.75)	0.636 * (2.11)	0.323 (1.05)	0.647 * (2)	0.751 * (2.28)
CEECs	-0.638 (-1.53)	-0.673 (-1.61)	-0.447 (-1.11)	-0.558 (-1.40)	-0.782 (-1.91)	-0.756 (-1.84)
Nafrica	-4.220 *** (-4.40)	-4.221 *** (-4.41)	-3.061 ** (-3.24)	-2.496 * (-2.64)	-3.198 *** (-3.33)	-3.450 *** (-3.60)
Chargé d'affaires i → X	-0.180 (-0.26)	-0.151 (-0.22)	-0.424 (-0.63)	-0.366 (-0.54)	-0.223 (-0.33)	-0.119 (-0.17)
Chargé d'affaires X → I	-0.0750 (-0.11)	-0.136 (-0.20)	-0.197 (-0.29)	-0.267 (-0.40)	-0.145 (-0.22)	-0.221 (-0.33)
Ambassador I → X	1.168 *** (3.56)	1.145 *** (3.48)	0.863 ** (2.67)	0.709 * (2.19)	0.949 ** (2.89)	1.046 ** (3.17)
Ambassador X → I	1.575 *** (4.79)	1.556 *** (4.73)	1.341 *** (4.15)	1.109 *** (3.43)	1.267 *** (3.86)	1.311 *** (3.98)
costexport_X	0.186 (0.61)					
costexport_I	-0.857 ** (-2.80)					
costimport_X		0.15 (0.47)				
costimport_I		-0.938 ** (-2.97)				
timeexport_X			-1.302 *** (-5.75)			
timeexport_I			-1.668 *** (-7.41)			
timeimport_X				-1.165 *** (-6.23)		
timeimport_I				-1.667 *** (-8.96)		
docexport_X					-0.739 * (-2.51)	
docexport_I					-1.923 *** (-6.55)	
docimport_X						-0.403 (-1.51)
docimport_I						-1.575 *** (-5.91)
Constant	-17.71 *** (-4.73)	-17.35 *** (-4.78)	-19.66 *** (-9.38)	-23.37 *** (-11.34)	-21.31 *** (-10.14)	-20.81 *** (-9.80)
N	1525	1525	1525	1525	1525	1525
adj. R2	0.431	0.431	0.455	0.462	0.444	0.441

Note: t statistics in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001. X stands for the exporting country side and I for the importing one. I → X means that a representative agent has been sent to the exporting country by the importing one.

Table 2.4.B. Diplomatic representation and Doing Business – Parts and Components

	(7)	(8)	(9)	(10)	(11)	(12)
lnpop_X	0.801 *** (16.21)	0.843 *** (16.98)	0.996 *** (21.12)	1.160 *** (24.31)	1.046 *** (23.69)	0.972 *** (22)
lnpop_I	0.439 *** (8.92)	0.452 *** (9.13)	0.597 *** (12.72)	0.713 *** (15.01)	0.668 *** (15.15)	0.625 *** (14.17)
Indist	-1.605 *** (-12.97)	-1.586 *** (-13.01)	-1.572 *** (-13.86)	-1.594 *** (-14.53)	-1.671 *** (-15.74)	-1.692 *** (-15.71)
contiguity	0.336 (1.25)	0.362 (1.35)	0.550 * (2.21)	0.540 * (2.24)	0.311 (1.34)	0.268 (1.13)
commonleg	-0.792 *** (-5.13)	-0.718 *** (-4.65)	-0.249 (-1.70)	-0.0733 (-0.51)	-0.0206 (-0.15)	-0.0609 (-0.43)
comlang_off	0.794 * (2.28)	0.837 * (2.42)	-0.0896 (-0.27)	-0.0282 (-0.09)	-0.166 (-0.55)	0.153 (0.5)
EU15	1.941 *** (10.23)	1.872 *** (9.9)	1.101 *** (6)	0.711 *** (3.91)	0.32 (1.76)	0.285 (1.52)
CEECs	0.373 (1.39)	0.266 (0.99)	0.625 * (2.55)	0.507 * (2.14)	0.0275 (0.12)	0.00402 (0.02)
Nafrika	-4.407 *** (-7.00)	-4.450 *** (-7.13)	-3.195 *** (-5.47)	-2.501 *** (-4.40)	-2.469 *** (-4.50)	-2.710 *** (-4.88)
Chargé d'affaires i → X	1.115 * (2.54)	0.968 * (2.22)	0.778 (1.91)	0.692 (1.76)	0.829 * (2.19)	0.705 (1.83)
Chargé d'affaires X → I	0.858 (1.95)	0.921 * (2.11)	0.788 (1.94)	0.864 * (2.2)	0.925 * (2.44)	1.026 ** (2.66)
Ambassador I → X	2.001 *** (9.44)	1.915 *** (9.09)	1.623 *** (8.24)	1.355 *** (7.06)	1.279 *** (6.91)	1.317 *** (7.01)
Ambassador X → I	1.559 *** (7.35)	1.537 *** (7.3)	1.337 *** (6.79)	1.148 *** (5.99)	1.165 *** (6.29)	1.254 *** (6.68)
costexport_X	-0.871 *** (-4.44)					
costexport_I	-0.0204 (-0.10)					
costimport_X		-1.377 *** (-6.84)				
costimport_I		-0.0322 (-0.16)				
timeexport_X			-2.187 *** (-16.17)			
timeexport_I			-1.048 *** (-7.80)			
timeimport_X				-2.147 *** (-19.68)		
timeimport_I				-1.056 *** (-9.72)		
docexport_X					-3.815 *** (-23.18)	
docexport_I					-1.595 *** (-9.75)	
docimport_X						-3.334 *** (-21.99)
docimport_I						-1.339 *** (-8.86)
Constant	-3.965 (-1.65)	-1.230 (-0.53)	-7.327 *** (-5.75)	-11.43 *** (-9.36)	-8.094 *** (-6.85)	-6.600 *** (-5.46)
N	1544	1544	1544	1544	1544	1544
adj. R2	0.648	0.654	0.7	0.72	0.738	0.731

Note: t statistics in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001. X stands for the exporting country side and I for the importing one. I → X means that a representative agent has been sent to the exporting country by the importing one.

Table 2.4.C. Diplomatic representation and Doing Business – Capital goods

	(1)	(2)	(3)	(4)	(5)	(6)
lnpop_X	0.968 *** (12.57)	0.968 *** (12.41)	1.134 *** (14.52)	1.236 *** (15.23)	1.077 *** (13.65)	1.043 *** (13.38)
lnpop_I	0.796 *** (10.43)	0.820 *** (10.6)	0.965 *** (12.48)	1.096 *** (13.63)	0.918 *** (11.7)	0.866 *** (11.18)
Indist	-1.107 *** (-5.72)	-1.087 *** (-5.66)	-1.122 *** (-5.97)	-1.138 *** (-6.09)	-1.143 *** (-6.01)	-1.141 *** (-5.98)
contiguity	1.060 * (2.55)	1.072 * (2.57)	1.223 ** (2.99)	1.208 ** (2.98)	1.031 * (2.5)	1.012 * (2.45)
commonleg	0.28 (1.17)	0.311 (1.29)	0.805 *** (3.32)	0.944 *** (3.89)	0.651 ** (2.64)	0.575 * (2.33)
comlang_off	2.829 *** (5.24)	2.851 *** (5.28)	2.006 *** (3.73)	2.090 *** (3.94)	2.348 *** (4.34)	2.551 *** (4.74)
EU15	1.426 *** (4.85)	1.403 *** (4.75)	0.636 * (2.11)	0.323 (1.05)	0.647 * (2)	0.751 * (2.28)
CEECs	-0.638 (-1.53)	-0.673 (-1.61)	-0.447 (-1.11)	-0.558 (-1.40)	-0.782 (-1.91)	-0.756 (-1.84)
Nafrica	-4.220 *** (-4.40)	-4.221 *** (-4.41)	-3.061 ** (-3.24)	-2.496 * (-2.64)	-3.198 *** (-3.33)	-3.450 *** (-3.60)
Chargé d'affaires i → X	-0.180 (-0.26)	-0.151 (-0.22)	-0.424 (-0.63)	-0.366 (-0.54)	-0.223 (-0.33)	-0.119 (-0.17)
Chargé d'affaires X → I	-0.0750 (-0.11)	-0.136 (-0.20)	-0.197 (-0.29)	-0.267 (-0.40)	-0.145 (-0.22)	-0.221 (-0.33)
Ambassador I → X	1.168 *** (3.56)	1.145 *** (3.48)	0.863 ** (2.67)	0.709 * (2.19)	0.949 ** (2.89)	1.046 ** (3.17)
Ambassador X → I	1.575 *** (4.79)	1.556 *** (4.73)	1.341 *** (4.15)	1.109 *** (3.43)	1.267 *** (3.86)	1.311 *** (3.98)
costexport_X	0.186 (0.61)					
costexport_I	-0.857 ** (-2.80)					
costimport_X		0.15 (0.47)				
costimport_I		-0.938 ** (-2.97)				
timeexport_X			-1.302 *** (-5.75)			
timeexport_I			-1.668 *** (-7.41)			
timeimport_X				-1.165 *** (-6.23)		
timeimport_I				-1.667 *** (-8.96)		
docexport_X					-0.739 * (-2.51)	
docexport_I					-1.923 *** (-6.55)	
docimport_X						-0.403 (-1.51)
docimport_I						-1.575 *** (-5.91)
Constant	-17.71 *** (-4.73)	-17.35 *** (-4.78)	-19.66 *** (-9.38)	-23.37 *** (-11.34)	-21.31 *** (-10.14)	-20.81 *** (-9.80)
N	1525	1525	1525	1525	1525	1525
adj. R2	0.431	0.431	0.455	0.462	0.444	0.441

Note: t statistics in parentheses. * p < 0.05, ** p < 0.01, *** p < 0.001. X stands for the exporting country side and I for the importing one. I → X means that a representative agent has been sent to the exporting country by the importing one.

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Tables 2.5 and 2.6 illustrate the results and give an idea of their magnitude by answering the following questions: By how much would the bilateral trade fixed effects increase if the level of LPI achieved by CEECs (respectively, Doing Business) was adopted by North African countries (Table 2.6) Similarly, what is the equivalent of opening an embassy in terms of LPI (respectively, Doing Business) improvement (Table 2.5) Before looking at these last two tables, we must remind the reader of the sign of the coefficients, which are positive for the LPI and negative for the Doing Business. We also must take a closer look at the size of their effect which is substantially different between the both variables. In the previous tables, we indeed saw that the LPI tended to have a bigger effect on trade than the Doing Business. That special feature will have an incidence on Table 2.6. This is not unusual in the trade facilitation literature. This can be seen, for example, in the work of Portugal-Perez and Wilson (2009) on Africa, where the coefficients on the export side are often two times higher (or more) for the LPI than for the Doing Business.

From Table 2.6 we can infer that much of the missing bilateral trade fixed effect of North African countries could be realized by switching LPI and Doing Business indices to the level achieved in CEECs that are comparable in emerging countries but more advanced in the area of trade facilitation and friendlier in their Doing Business institutions. The growth rate of the bilateral trade fixed effect induced by an improvement in the LPI or Doing Business indices represents up to 85 percent of the rate of growth that is needed to fill the gap between the average trade bilateral fixed effects in the CEECs and North Africa. The benefit from opening an embassy in the exporting or importing country also plays an important role. According to column (F) in Table 2.6, opening an embassy is equivalent to a reduction of trade cost by a factor ranging from 8 to 11 times the standard deviation of the implied trade cost variable.

Table 2.5. Opening an embassy versus trade facilitation (LPI and Doing Business)

Explanatory variables (X)	Coefficients (from Table 2.1 and 2.2)	Standard deviations	Embassy coefficient	Improvement in X equivalent to the opening of an embassy	In % of the standard deviations
	(A)	(B)	(C)	(D*)	(E**)
LPIscore_X	10.94	0.177	0.652	0.059	33.6
LPIscore_I	6.035	0.177	0.308	0.051	28.77
Customs_X	8.83	0.206	0.797	0.0902	43.8
Customs_I	4.775	0.206	0.405	0.085	41.16
Infrastructures_X	7.887	0.224	0.824	0.104	46.49
Infrastructures_I	4.204	0.224	0.437	0.104	46.49
Logisticservices_X	9.197	0.196	0.741	0.08	41.07
Logisticservices_I	5.081	0.196	0.363	0.071	36.42
Tracking_X	9.971	0.191	0.721	0.072	37.88
Tracking_I	5.343	0.191	0.352	0.066	34.51
Timeliness_X	13.9	0.141	0.689	0.095	35.11
Timeliness_I	7.259	0.141	0.342	0.047	33.37
Costexport_X	-1.279	0.325	1.946	-1.521	-466.78
Costexport_I	-0.324	0.326	1.171	-3.614	-1108.79
Costimport_X	-1.803	0.343	1.819	-1.009	-293.80
Costimport_I	-0.445	0.343	1.102	-2.476	-721.18
Timeexport_X	-2.437	0.483	1.441	-0.591	-122.39
Timeexport_I	-0.874	0.48	0.966	-1.105	-228.78
Timeimport_X	-2.219	0.621	1.197	-0.539	-86.86
Timeimport_I	-0.934	0.621	0.772	-0.826	-133.10
Docexport_X	-3.505	0.354	1.34	-0.382	-107.92
Docexport_I	-1.927	0.354	0.742	-0.385	-108.70
Docimport_X	-3.37	0.386	1.343	-0.398	-103.15
Docimport_I	-1.413	0.386	0.911	-0.645	-166.89

Note:

D* = (C/A),

E** = (D/B) × 100.

Table 2.6. Opening an embassy to fill in the gap between North Africa and CEECs'

trade bilateral fixed effect

Explanatory variables (X)	Coefficients of X (from Tables 2.1 and 2.2)	Mean of X for CEECs	Mean of X for North Africa	Change in X if North Africa adopted the average quality of X found in the CEECs	Increase in $e^{\mu_{ij}}$, the exponential of the bilateral trade fixed effect	In % of the rate of growth which allows to achieve the average bilateral fixed effect in the CEECs
	(A)	(B)	(C)	(D*)	(E**)	(F***)
LPIscore_X	10.94	1.098	0.931	1.82	5.21	62.67
LPIscore_I	6.035	1.098	0.931	1.01	1.74	20.91
Customs_X	8.83	1.011	0.832	1.586	3.88	46.68
Customs_I	4.775	1.011	0.832	0.858	1.36	16.32
Infrastructures_X	7.887	1.023	0.84	1.45	3.25	39.05
Infrastructures_I	4.204	1.023	0.84	0.77	1.16	13.98
Logisticservices_X	9.197	1.074	0.905	1.55	3.73	44.8
Logisticservices_I	5.081	1.074	0.905	0.86	1.36	16.33
Tracking_X	9.971	1.096	0.917	1.78	4.96	59.64
Tracking_I	5.343	1.096	0.917	0.957	1.6	19.27
Timeliness_X	13.9	1.255	1.105	2.08	7.03	84.49
Timeliness_I	7.259	1.255	1.105	1.09	1.97	23.65
Costexport_X	-1.279	6.853	7.014	0,205	0.23	2.73
Costexport_I	-0.324	6.853	7.014	0,051	0.05	0.64
Costimport_X	-1.803	6.895	7.213	0,573	0.77	9.3
Costimport_I	-0.445	6.895	7.213	0,141	0.15	1.83
Timeexport_X	-2.437	2.732	3.074	0,832	1.3	15.61
Timeexport_I	-0.874	2.73	3.074	0,298	0.35	4.18
Timeimport_X	-2.219	2.7	3.394	1,545	3.69	44.31
Timeimport_I	-0.934	2.7	3.394	0,650	0.92	11.01
Docexport_X	-3.505	1.577	1.887	1,088	1.97	23.66
Docexport_I	-1.927	1.577	1.887	0,598	0.82	9.84
Docimport_X	-3.37	1.731	2.022	0,979	1.66	19.97
Docimport_I	-1.413	1.731	2.022	0,410	0.51	6.1

Note:

$$D^* = (B - C) \times A$$

$$E^{**} = [(e^{D+\mu_{ij}})/e^{\mu_{ij}}] - 1,$$

$F^{**} = [E/8.32] \times 100$, where 8.32 is the rate of growth implied by switching LPI and Doing Business indices characterizing CEECs.

CONCLUSION

Through the use of a gravity model and a database of trade and diplomatic variables over the period 2005–12, this chapter has analysed the trade relationship between European countries (including Central and Eastern Europe) and countries of North Africa. Our results suggest that reducing the cost and fees for trading across the border (namely the fees associated with the export and import of a 20-foot container), the number of legal documents, the average time needed to ship a container, and also the quality of the logistics, infrastructures and services related to trading activities, would fill the gap between the average bilateral fixed effect of North Africa and of the CEECs, the latter being significantly higher. Opening an embassy plays a significant role towards the improvement of trade logistics in these countries, as measured by the Doing Business and LPI indicators of the World Bank. The observed difference in trade between North African countries and transition European countries can therefore be potentially attributed to the quality of soft infrastructure and hard infrastructure in these countries.

Those results have policy implications as they contribute to the discussion on the relative role of traditional trade policy tools – tariffs and non-tariffs measures – and trade facilitation measures, the latter being powerful drivers of regional trade integration. More specifically they suggest that the implementation of the Trade Facilitation Agreement (TFA), which would help to move towards the frontier value of the LPI or Doing Business indicators for the CEECs, could allow North African countries to achieve better trade

integration through a reduction of their trade costs⁸. Opening embassies as companion measures could therefore reinforce TFA in promoting regional trade integration.

⁸ This conclusion is drawn also by de Melo and Wagner (2016), who put the emphasis on the reduction in trade costs, while this chapter provides complementary evidence on the substantial increase in trade.

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CHAPTER III.

FIRM ENTRY AND EXIT DURING A CRISIS PERIOD, EVIDENCE FROM RUSSIAN REGIONS⁹

INTRODUCTION

One generation after the launch of the perestroika, two features characterize Russian business relative to many other transition countries: first, barriers to entry are considerably more pronounced and second, as a result, the extremely low level of firm entry in Russia by international standards. The Amadeus dataset, which is restricted to firms with more than 50 employees, provides a record of formal entry and shows gross entry rates from 1999 at below one percent. Entry rates are significantly lower in Russia than in other former socialist economies, and even these are (negative) outliers by developed economy standards (Aidis and Estrin, 2006; Aidis and Adachi, 2007; Aidis et al., 2008). For comparison, in Brazil the gross entry rates are up to 14% and net entry rates in China and India of over 6% pa and 3–4% pa, respectively. The picture that emerges is a blessing curse, as growth is fuelled by oil exports, while other economically important areas, such as small and medium enterprises (SMEs), are underdeveloped.

The reinforcement of SMEs is key for the emergence of values and norms attached to the market economy. In terms of purely formal constraints, Russia performs relatively well; but enforcement is poor. The rule of law is also weak, creating uncertainty and non-consistency, which is damaging to the firms' prosperity. The absence of confidence in

⁹ Published as Iwasaki, I., Maurel, M. and Meunier, B., (2016), Firm entry and exit during a crisis period: Evidence from Russian regions, Russian Journal of Economics, 2, issue 2, p. 162-191.

investing at home is reflected by the net private capital outflows, which stood in 2014 at \$150 billion, equivalent to 8% of GDP. One of the main problems faced by Russian business owners is illegal practices such as bribing and corruption, as repetitively reflected in the Russian firms' survey by the World Bank. The fatality of being involved in corruption activities constitutes the main pervasive and self-reinforcing entry barrier.

The World Bank doing business indicators provide useful information for assessing the quality of the business environment across a large set of countries: ease of doing business, starting a business (licenses), getting electricity, registering property, getting credit, protecting minority investors, enforcing contracts, resolving insolvency. As reported by Doing Business, Russia ranks 13th out of 25, its worst position being registered under the protection of minority investors, trading across borders, and dealing with construction permits items. Two out of those three indicators correspond to our research questions: Trading across borders records the time and cost associated with the logistical process of exporting and importing goods. More precisely, it measures the time and cost (excluding tariffs) associated with three sets of procedures— documentary compliance, border compliance and domestic transport — within the overall process of exporting or importing a shipment of goods. This indicator describes the logistical obstacles towards a deeper integration of Russian enterprises into the world economy. Protection of minority rights measures the strength of minority shareholder's protection against misuse of corporate assets by directors for their personal gain, as well as shareholder rights, governance safeguards and corporate transparency requirements that reduce the risk of abuse. One interesting component in the building of the protection of minority rights is the ease of shareholder suit index, which is one of our variables of interest.

Another pernicious feature of the Russian economic performance over the recent decades is the continuous fall of non-energy goods and services in total exports, echoing

the weaknesses of SMEs in the manufacturing and service sectors, while oil represents the lion's share of total trade. In fact, in recent years, the concentration of Russia's economy in the oil and gas sector has steadily increased over time. In addition, Russia's non-energy sector has become less competitive in world markets. While the volume of the nation's non-energy merchandise exports grew at an annual rate of 11% in 2010, they grew by only 7.6% in 2014¹⁰. According to the UNCTAD, cumulative foreign direct investments (FDI) per capita over the period 1989–2014 were low up to 2008 as compared with similar countries (CEECs EU and non-EU) and from 2008 onwards displayed a relatively higher trend. In the first period they stand at \$3558, respectively \$6562 for CEECs EU countries and \$3658 for CEECs non-EU countries. Same data over the second more recent period (2008–2014) delivers a different picture, Russia having attracted \$2443 of FDI per capita while CEECs EU countries and CEECs non-EU countries received \$2534 and \$2174 of FDI per capita, respectively. Needless to say, the top donor of inward FDI is the fuel and energy sector¹¹. Overall, Russia's comparative advantage in the oil sector is reinforcing in the last decade. It corresponds to a double hypothesis, which our empirical analysis is focusing on: first the country's sensitivity to the crisis passes essentially to the evolution of the world market for oil. This has obvious repercussions for Russian SMEs because the shocks in the oil market are spreading to the rest of the economy. In addition, Russian firms face the curse of the oil rent, which is amplified by the institutional weaknesses such as the low enforcement of property rights and corruption, as mentioned above.

¹⁰ Authors' calculation based on the official statistics of the Federal State Statistical Service of Russia (<http://www.gks.ru>).

¹¹ UNCTAD database (<http://unctadstat.unctad.org>). See Iwasaki and Suganuma (2015a, 2015b) for details of the recent trend of international trade and FDI inflow in Russia.

Firm entry and exit during a crisis period, evidence from Russian regions

In this paper, we aim to analyse the determinants of firm entry and exit in Russia using a hand-crafted regional-level panel data for the years of 2008–2014, with a special emphasis on the institutional failures and the politico-economic impact of external crises. We found that these two elements exhibit statistically significant and economically meaningful effects both on the creation and destruction of Russian firms, while controlling for potentially explanatory factors. The robust estimate of the world oil price, irrespective of the difference in target regions, indicates that Russian regions are possibly sensitive to a global crisis whatever the circumstances. Accordingly, the ongoing crisis may bring a harmful influence to a regeneration of the Russian business.

The study of firm's birth and death in Russia is relatively scarce. Noticeable exceptions are Rinaldi (2008), Iwasaki (2014), and Sprenger (2014), who investigated the firm-level determinants of survival. This paper complements their findings by identifying the national and regional-level factors that significantly affect both the market entry and exit of Russian firms.

The remainder of the paper is structured as follows: The next section reviews the literature about firms' net entry and creative destruction, by focusing on transition countries. Section 3 presents statistical evidence on the entry and exit of Russian firms over the period 2008–2014. Section 4 conducts the empirical analysis while Section 5 interprets the empirical results and concludes the paper.

LITERATURE REVIEW

The process of entry of new firms is an important element in the dynamics of market economies, as underlined by Caves (1998) and Bartelsman et al. (2004). New firm entry helps to transfer resources from low to high productivity activities and underlies competitive pressures dissipating monopoly rents. When analysing ways in which institutional change affects the performance of developing economies, North (1991) emphasized the role that the institutional environment plays in promoting entrepreneurial development and the impact of informal as well as formal institutions, suggesting that entry barriers may be higher in developing countries where the general business environment is weaker. As a developing economy, Russia is indeed characterized by a complex system of entry barriers or entry fostering mechanisms. The weakness of institutions enhances the market power of incumbents (Djankov et al., 2002), with harmful implications for welfare (Banerjee and Ghatak, 2005). Following these ideas, the work of De Soto (1990) has suggested that regulation of entry represents an important entry barrier in emerging markets. The literature has argued that regulation is introduced by policy makers in their own interests, namely the pursuit of their own remuneration (Shleifer and Vishny, 1993). When analysing how legal and institutional environments raise the cost of doing business, Friedman et al. (2000) found that the costs of enforcing contracts are associated with higher level of corruption. These additional costs bear more heavily on entrants than incumbents and poor institutional environments enhance the advantages to incumbents yielded by higher levels of regulation.

The empirical evidence on emerging markets strongly supports the predictions with respect to regulations, but the argument with regard to institutions has rarely been tested. Using data on regulations of entry in 85 countries, Djankov et al. (2002) find a positive

relationship between the size of informal economy (in turn highly correlated with corruption), and the burden of the entry regulation measured by the number of procedures, time and cost of starting a firm. Similarly, Klapper et al. (2006) find that regulations hinder entry, notably those which are in naturally “high entry” industries. However, regulations are not always welfare reducing; labour regulations reduce entry into labour intensive sectors but property rights protection increases entry in R&D intensive sectors (Bertrand and Kramarz, 2002). Ciccone and Papaionnaou (2007) show that entry rates are higher when the time for registering new businesses is lower, although this is also influenced by demand and technology factors.

In the specific case of Russia, Aidis and Adachi (2007) attempt to find out the reason for a relatively low number of new firms. Since the internationally comparative data do not provide an explanation for this situation, the authors conclude that the low degree of firm creation and the low survival rate of newly created businesses are due to informal impediments associated with the lack of rule of law, inconsistent enforcement of regulations, regional autonomy and pervasive corruption. These findings are consistent with the conclusions of the survey carried out by Estrin and Prevezer (2010) in a selected group of emerging economies. The survey displays widely varying entry and exit rates among the countries, which is due to different institutional settings. In the case of Russia, relatively good formal rules and structures are undermined by informal mechanisms deterring or blocking business entry.

The exiting literature has also highlighted the weak institutional environment in Russia with respect to entrepreneurship (Aidis et al., 2008) with negative informal values towards private business and lack of property rights enforcement (Puffer and McCarthy, 2001; Aidis and Adachi, 2007). Berkowitz and DeJong (2005) show that Russian regional entrepreneurial activity exhibits a statistically and quantitatively significant relationship

with subsequent growth. However, the regulatory stance that the Russian national and local governments take toward business and the levels of corruption work to the detriment of private sector development (Frye and Shleifer, 1997). Given these specific institutional weaknesses, recent studies have highlighted different aspects concerning the diffusion of new entrepreneurs in connection with institutions. For instance, Aidis et al. (2008) explore the impact of the entrepreneurial environment by comparing Russia with other economies. Their results suggest that the negative environment for business in Russia has led to low levels of entrepreneurship. The authors conclude that the weakness of Russian institutions is detrimental to entrepreneurial activity and although networks are important, they are not entirely able to offset these deficiencies. In parallel, Bruno et al. (2008), who analyse a three-year panel of Russian firms, conclude that the entry rates in Russia are correlated with institutions and firm size. A recent paper by Iwasaki (2014) confirms the key importance of institutions, by providing strong evidence that the independence of governance bodies from top management is positively correlated with the survival probability of the firm. This result is in line with one key aspect in corporate governance research: outside shareholders and outsider board members feel freer to criticize the company management than employee shareholders and insider directors, who are more likely to support their company's top executives.

In this paper we also try to quantify the extent to which the 2008 financial shock and subsequent economic crisis affected the firm creation and destruction in Russia. The global turmoil impacted the emerging countries in different ways, depending on their previous growth patterns and forms of international integration (Drahokoupil and Myant, 2012). The initial shock in the United States spread over the rest of the world through a contagion/transmission mechanism which transformed the initial sub-prime crisis into a global economic turmoil. Although being major beneficiaries of the economic boom before

2007, the emerging countries became the first victims of the global crisis after 2008 (Dolphin and Chappell, 2010). This is because the world economy is much more integrated and interdependent today than ten or twenty years ago, which implies a limited national economic sovereignty and consequently higher exposure of all countries to international macroeconomic fluctuations (Dabrowski, 2010). Gurtner (2010) considers that the crisis was transmitted primarily by trade and financial flows and the impact on emerging countries was higher in those that were highly integrated in the world economy.

Although Russia entered the crisis with a strong fiscal position, low public debt and large reserves (Bogetic et al., 2010,) the country experienced one of the sharpest declines of GDP. According to Blanchard et al. (2010), the first shock announcing the crisis was related to the war in Georgia, which practically opened the transmission channel to the economic turbulence. A severe decline in the stock market took place in August 2008, compounded by plummeting oil prices, which initiated a severe economic recession (Barannik, 2010). As a result, numerous weaknesses of Russia's export-dependent economy in the money markets and in the financial sector started to evolve. The high impact of the crisis, in spite of very good fiscal situation, was due to three main factors (Ickes and Gaddy, 2010): high dependence of the economy on oil and gas, addiction to resources rents, and the specificity of "Protection Racket" system of political economy. These systemic problems have obstructed the complete recovery of the economy after the 2008 crisis.

Further, in December 2014, Russia entered a new financial crisis which has exposed the real scale of the economic problems that have been growing in the country for several years. The main macroeconomic indicators deteriorated considerably, the confidence of its citizens in the state and in institutions in charge of economic stability declined, the government and business elites became increasingly dissatisfied with the policy direction adopted by the Kremlin, and fighting started over the shrinking resources (Łabuszewska,

2015). It should be noted that in addition to the crisis aspect, the Russian economy has been equally affected by the EU-USA sanctions following the annexation of Crimea and further activities in Eastern Ukraine. Oxenstierna and Olsson (2015) conclude that the targeted economic sanctions have contributed to imposing a cost on the Russian economy. In the presence of a politicized economic system, this gave advantage in resource allocation to rent-addicted loss-making producers loyal to the regime over competitive companies, which damaged the country's economic performance. On top of those factors, the falling oil price on the world markets, coupled with the depreciation of the ruble, have weakened even more the terms of trade.

Based on the above discussions, we conjecture that the firm entry rate into the market is impacted mainly through the evolution of the oil sector, a fact that is entirely compatible with the low integration of Russian SMEs in the world economy. We also give great attention to the institutional failures that reinforce the curse of the oil sector, namely the poor efficiency of the judiciary system. The latter contributes to bail out inefficient firms and to reinforce barriers to entry and exit.

STATISTICAL OVERVIEW

In this section, we overlook the dynamics and trends of firm entry and exit in Russia overall and its regions during the period 2008–2014. The Federal State Statistics Service (Rosstat) discloses monthly rates of firm entry and exit all over the Russian Federation, and yearly rates for federal districts and constituent entities, which are displayed in Figures 3.1 and 3.2, and in Table 3.1.

Panel (a) of Figure 3.1 shows that, as argued in the previous section, firm entry rates in Russia are relatively low and depict a slight decreasing trend (from more than 9 newly established companies per 1,000 existing firms to 8 per 1,000 between 2008 and 2014). On the other hand, as shown in Panel (b) of the same figure, the number of liquidated companies per 1,000 firms is even lower, but exhibits a much stronger and significant increase (by about two points during the same period). In fact, a simple OLS regression of the firm entry and exit rates on a time trend variable shows that the monthly firm entry rate decreases by 0.0145 and the firm exit rate increases by 0.0673 at 5% and 1% level of statistical significance, respectively. The estimation results are the following:

$$\begin{array}{llllll} \text{Firm entry} & = 8.660^{***} & - 0.0145^{**} & \times \text{Trend} & N = 84, & R^2 = 0.074, \quad F = 5.28^{**} \\ & & (25.25) & (-2.30) & & \\ \text{Firm exit} & = 2.784^{***} & + 0.0673^{***} & \times \text{Trend} & N = 84, & R^2 = 0.551, \quad F = 83.76^{***} \\ & & (12.44) & (9.15) & & \end{array}$$

Figures in parentheses beneath regression coefficients are t-statistics computed based on robust standard errors. *** and ** denote statistical significance at the 1% and 5% levels, respectively. Null hypothesis of the F-test is that all coefficients are zero.

Regarding the entry of new firms into the market, Panel (a) of Figure 3.1 shows that the trend started to revert towards mid-2012 with a slight increasing tendency in the

beginning of the second semester of 2014. Over the whole period of observation, the evolution of firm entry is rather chaotic, with successive peaks and bottoms; for example, in October 2008 the firm entry rate was 10.1% but in January 2009 it fell to 5.2%, and then again increased to 8.6% by March 2009. This erratic evolution can be observed during the whole time horizon 2008–2014, which shows a significant degree of instability in the economy coupled with high uncertainty related to legislation, political and institutional environment, and discretionary bureaucratic practices in granting new business licenses. On annual basis Panel (a) of Figure 3.2 shows that the entry of Russian firms experienced a significant decline from 115.2 per 1,000 firms in 2008 to 88.7 in 2009, remaining afterwards at practically the same level between 2009 and 2014.

With respect to the firm exit, Panel (b) of Figure 3.1 shows a relatively constant increase of the indicator until the beginning of 2011, followed by a highly volatile evolution afterwards. This can be attributed to the previous factors — uncertainty and instability— related to informal mechanisms deterring the net expansion of businesses. As a result, towards the end of 2014 the new entries are entirely annulled by the number of firms quitting the market. On annual basis, as Panel (b) of Figure 3.2 exhibits, the firm exit rate depicts a modest increase until 2010, then a sudden jump in 2011, followed by a declining trend in the last two years of the period. The high difference in the firm exit rates between 2010 and 2011 can be attributed to the world economic crisis, whose impact arrived with some time lag as compared to the entry rates, where the effect of the global turmoil took place immediately.

Figure 3.2 also illustrates time-series changes of firm entry and exit rates at the level of federal districts. From this figure we can observe that there is a weak but negative trend in firm entry, while a notable increasing trend exists in the case of firm exit. In other words, as in the whole federation, Russian districts have experienced an accelerated decrease of

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turnover (number of firms created plus the number of firms that left the market) since January 2008, with a much more significant contribution of the firm exit. The declining trend of entries, coupled with an increasing tendency of exit rates, suggest an overall low survival rate of Russian companies on the market, as discussed in Aidis and Adachi (2007).

The Appendix Table reports the rankings of Russian regions in terms of firm entry and exit rates in 2008 and 2014. This table suggests that the situation of each particular region changed substantially during the period. In fact, according to Panel (a) of Appendix 3, out of the first 10 regions ranked with respect to the firm entry rates in 2008, only four are present in the top 10 six years later, in 2014 (Perm Territory, Sverdlovsk, Ivanovo and Nizhny Novgorod). The best performer of 2008 (Chechen Republic) is ranked only 46th in 2014. With few exceptions, we therefore cannot speak about constantly good performers. The business development in a particular region and in a specific period is probably subject to the political orientation of local authorities; when local governments are politically consonant with the central power the region performs well.

Similarly, as indicated in Panel (b) of Appendix 1, out of the top 10 regions recording the lowest firm exit rates in 2008 only three of them (Kaluga, Moscow region and Khanty-Mansi Area) are ranked in 2014 among the first ten best performers; the Moscow capital, for instance, lost 78 positions over the period, passing from an exit rate of 21.7 in 2008 to 120 six years later. At the same time, the Russian Federation contains regions where both firm entry and exit rates are high in 2014 (Saint Petersburg: entry rate 112.7; exit rate 103), as well as regions where both indicators are low (Stavropol: entry rate 53.8; exit rate 35.3). The two categories of regions are relatively balanced and record overall a net rate of business creation. Nevertheless, there are certain regions where the entry rate is low and the exit rate high (Chukotka Area: entry rate 49.8; exit rate 86.5), which implies a net rate of firm destruction and consequently economic depression. There

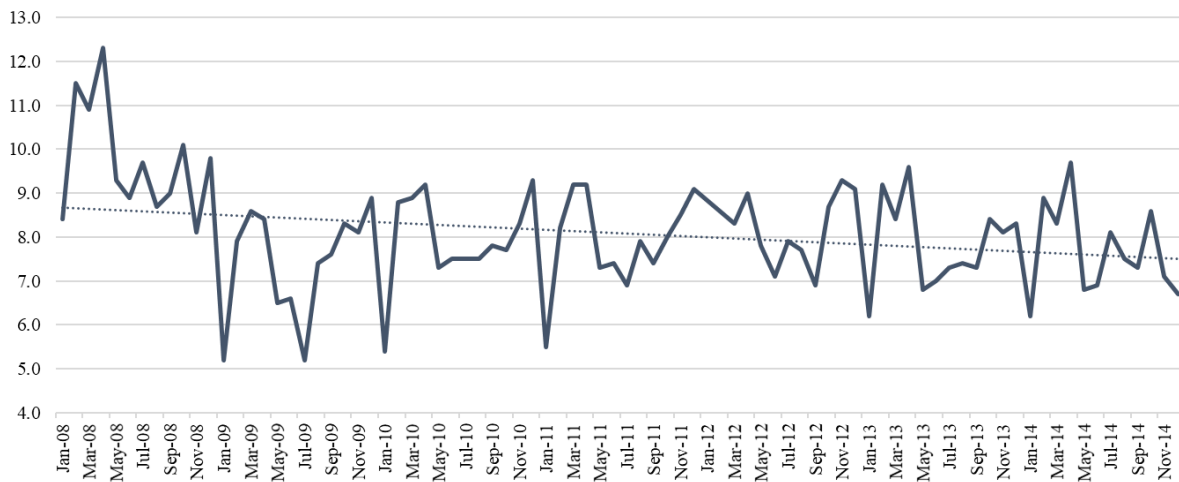
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are only very few regions where high firm entry rates coexist with low exit rates, implying a good development potential: only one such region is found within the top 20 with respect to high entry, respectively low exit rates — Republic of Udmurtia: entry rate 103.2; exit rate 51.4.

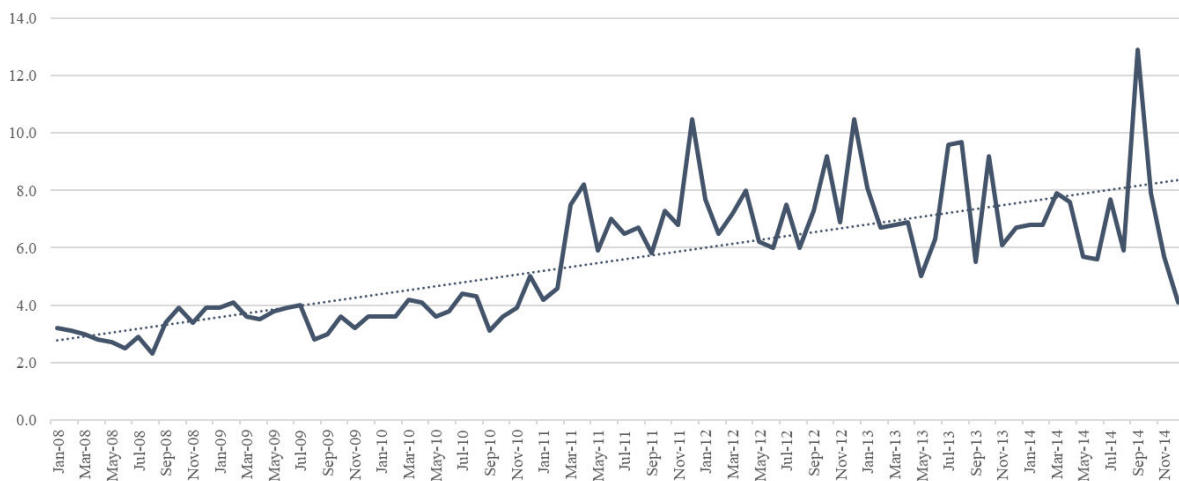
In sum, the aforementioned findings suggest firstly that the market entry of Russian firms was discouraged by the global financial crisis, which started in September 2008 and lasted at the end of 2014, a period characterized by subsequent economic downturns. Firms' exit exhibited a strong upward trend and it is conceivable that this phenomenon was also triggered by the 2008 financial shock from the US and amplified by the following crises in Europe and Ukraine. Second, the above tendency was observed in all federal districts, suggesting that the recent crises have negatively influenced Russian firms and entrepreneurs whatever their geographical location and specialization. Third, the level and volatility of firms' entry and exit rates vary greatly across Russian regions and over time. This suggests that the impact of the crisis was different, depending on the vulnerability to the world crisis and the reliance on the oil sector, but, in a more discriminative way, on the differences in institutional and business environments.

Figure 3.1. Dynamics of firm entry and exit in Russia, 2008–2014.

(a). Firm Entry



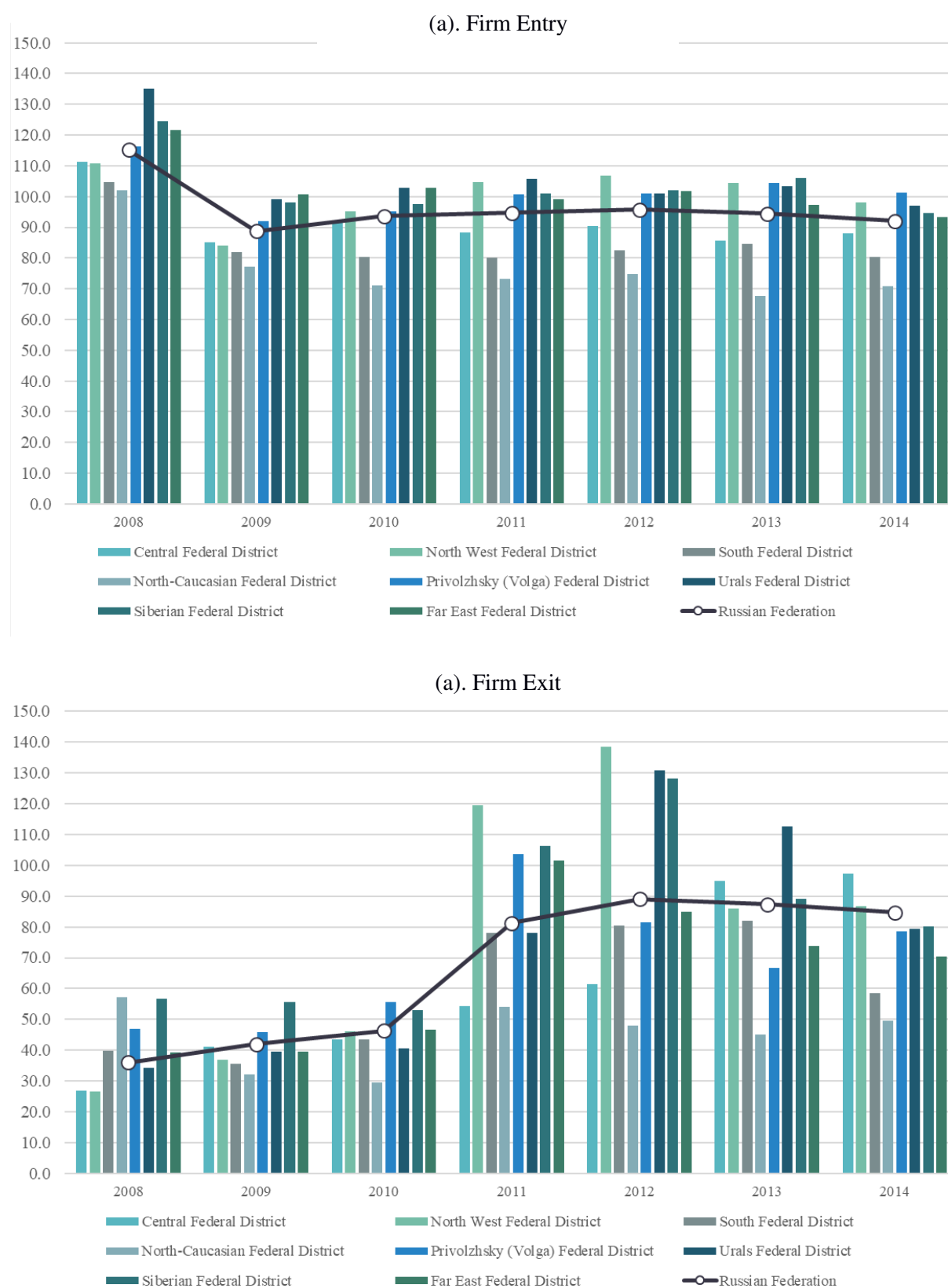
(b). Firm Exit



Note: Firm entry and exit rate denote number of newly established and liquidated firms per 1,000 organizations, respectively.

Source: Russian Federal State Statistics Service (<http://www.gks.ru>).

Figure 3.2. Dynamics of firm entry and exit in Russia, 2008–2014.



Note: Firm entry and exit rate denote number of newly established and liquidated firms per 1,000 organizations, respectively.

Source: Russian Federal State Statistics Service (<http://www.gks.ru>).

EMPIRICAL ANALYSIS

In this section, we will empirically examine the determinants of firm entry and exit in Russia using a regional-level panel data for the period between 2008 and 2014. Here, inspired by the arguments in the existing literature and the observations reported in the previous section, we intend to perform regression analysis paying a special attention to two aspects: institutional failures and the recent politico-economic crises. More specifically, we will estimate a multivariate regression equation, which takes a natural logarithm of firm entry or exit rate as a dependent variable and proxies for the regional-level institutional quality and the economic integration as independent variables, while controlling for other potentially explanatory factors. The next subsection gives a detailed explanation of independent variables used in our regression analysis. Subsection 4.2 reports estimation results, and Subsection 4.3 checks statistical robustness of the empirical evidence.

Selection of independent variables

To assess the impact of institutional failures on the creation and destruction of Russian firms, we employed four proxies for the efficiency of the judiciary system which are available at the regional level. They include: the mean and median duration of lawsuit at a regional arbitration court, the acceptance rate of petition by regional arbitration courts, and lawsuits application number to regional arbitration courts per 1,000 organizations. As emphasized in Dmitrieva et al. (2012), the duration of a lawsuit at a regional arbitration is a key aspect, as it affects the functioning of a business activity. Slowness and poor performance of the judiciary system to resolve disputes relating to the non-compliance with contracts and the non-payment of arrears can jeopardize the business of SMEs. For the latter, delayed payments combined with a limited access to bank credit can result in the inability to continue their business. The Russian Federation is classified as a “high

compliance country”, which refers to the level of compliance with international standards for corporate governance. The country is considered therefore as having a sound legal framework at a par with OECD ones (EBRD, 2005). Official data on entry costs (like number of days for starting a business and contract enforcement) puts Russia as the best performer of the BRIC countries. The time needed to resolve overdue payments fell from 7 to 6 weeks between 2002 and 2005. Formal barriers are relatively low. But the de facto reality is far from this de jure situation. Law enforcement is indeed arbitrary, with over 80% of Russian entrepreneurs suffering from broken contracts (Radaev, 2002). Johnson et al. (1999) indicate that relational contracting plays a significant role in Russia where the court system is inefficient, which is a strong obstacle to the normal development of SMEs. Overall, it seems that the legal and regulatory framework is blurred by numerous inconsistencies, with many Soviet regulations still in force; “No one really knows which laws and regulations are implemented and observed, although it is clear that many are not implemented at all, or only partially” (OECD, 2005, p. 5). These arguments suggest that the above four variables are likely to be negatively related to the net entry rate of Russian firms. We believe that, although these variables are cross-sectional due to information constraints, they reflect well the effectiveness of regional courts; not being derived formally from official definitions, they depict what really happens on the ground.

In addition to the above court-related variables, we will also utilize a criminal risk ranking evaluated by the Expert rating agency — a famous Russian think-tank, which is a regional-level time-variant variable, as an additional proxy for the institutional quality. According to the Transparency International, Russia has much worse levels of corruption than Brazil, China and India for 1998 — 2004, improving somewhat to converge with Indian levels in 2002. The Business Environment and Enterprise Performance Survey (BEEPS) reports a significant worsening in the perception of corruption between 2002 and

2005 as compared with transition countries, where the situation improved (EBRD, 2005). Corruption refers to the percentage of contract paid to secure a government contract, the percentage of respondents who agreed to pay irregular payments or gifts and losses due to crime as a share of sales, all of which appear to be significant in Russia. This corruption cannot be considered as being wheel-greasing, but it is rather linked to deficiencies in law enforcement, whereby legislation can be interpreted in discretionary ways by the authorities. Radaev (2002) finds that over 80% of Russian entrepreneurs had suffered from broken contracts. Guriev and Rachinsky (2004) argue that while industrial concentration has increased, the influence of incumbents increased; in certain regions, the governor's influence has protected incumbents who are members of the family: the region of Oryol, for instance (Aidis and Adachi, 2007), Kursk (Kryshtanovskaya and White, 2005). The Expert criminal ranking is regarded as a good proxy for the level of corruption and the institutional failure in general. Accordingly, we will estimate the coefficient of this variable together with the court-related variables. These five variables are called "institutional variables" hereinafter.

To assess possible impact of the politico-economic crises on firm entry and exit, we adopted four variables according to the discussion in Section 2. They comprise: a natural logarithm of world oil price, total trade volume as percentage of gross regional products (GRP), inflow of FDI in % of GRP, as well as a natural logarithm of direct distance between Brussels and the capital cities of Russian regions. As suggested in Kuboniwa (2014), the world oil price is extremely volatile against a global crisis and greatly influences the economic and business circumstances in Russia. Hence, we expect that the world oil price effectively captures macro-economic shocks of the recent crises on the whole Russian economy. A crisis may affect Russian firms and entrepreneurs through shrinking of international trade and FDI. The total trade and FDI in percent of GRP are used to grasp

these indirect effects of a crisis. The distance of Brussels and a regional capital is employed as a proxy for the geographical proximity of Russian regions to the EU. We assume that if other conditions are equal, Russian regions located near to the EU market tend to be negatively affected by a crisis much stronger than other regions. We call these four variables as “economic integration variables” hereinafter.

In the regression estimation, we will also control for a series of factors that represent medium-term economic development, financial constraints, quality of social infrastructure, degree of inter-firm competition, market density as well as natural obstacles for business. The medium-term economic development is expressed by the GRP growth rate. The financial constraint is measured by a natural logarithm of number of credit organizations and their branches per 100,000 residents, which is considered as one of major barriers to both starting up and expansion of businesses in Russia (Puffer and McCarthy, 2001; Pissarides et al., 2003). The quality of social infrastructure is proxied by a natural logarithm of number of PCs with internet connection per 100 workers, taking into account the fact that the information technology plays an important role in the contemporary Russian business. A natural logarithm of firms and organizations per 10,000 residents and population density are utilized to capture the effect of interfirm competition and market density, respectively. We expect that the former factor is negatively associated with firm entry and positively related to firm exit. On the other hand, we predict that the latter factor has a promoting effect of firm entry and exit. Average temperature in January serves as a proxy for natural obstacles for business, assuming that more severe climate conditions force Russian firms and entrepreneurs to take higher initial sunk costs that may restrict firm entry and exit (Iwasaki and Suganuma, 2005). In addition to the above six factors, we will also control for the time trend and district-level fixed effects, which, according to Figures 3.1 and 3.2, may have a statistically significant impact both on firm entry and exit.

With regard to the time-variant variables, to avoid possible endogeneity with the dependent variables, a lagged three-year moving average is utilized except for the world oil price, which is obviously exogenous for the overwhelming majority of Russian firms and entrepreneurs. The definition, descriptive statistics, and source of the aforesaid variables are described in Table 3.1.

Estimation results

Tables 3.2 and 3.3 show the estimation results of firm entry and exit models, respectively. To obtain coefficients of the time-invariant variables, we carry out a regression analysis by using a pooling OLS and a random-effects estimators and report one of these two estimation results according to the Breusch–Pagan test of the null-hypothesis that the variance of regional individual effects is zero. In both tables, Models [1] to [4] represent this kind of estimation results. In addition, to check statistical robustness of the time-variant variables, we also estimated a fixed-effect model and reported its result as Model [5].

With respect to the institutional variables, Table 3.2 shows that the acceptance rate of petition by regional arbitration courts and the lawsuits application number to regional arbitration courts are negatively related to firm entry with a statistical significance at the 10% and 1% level, respectively, in line with our prediction. In the same table, the Expert criminal ranking is insignificant as well as the mean and median duration of a lawsuit at a regional arbitration court in the random-effects models [1] to [4]. But it is given a significant and negative estimate in the fixed-effects model [5]. As shown in Table 3.3, four of the five institutional variables are significantly associated with firm exit and all their coefficients are negative, suggesting that the destruction of Russian firms is closely linked with institutional failure.

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With regard to the economic integration variables, the world oil price displays a remarkably robust estimate in the firm entry model. In fact, as reported in Table 3.2, this variable is estimated at 1% significance level with a positive sign in all the five models, irrespective of the difference in model specification and estimator. In contrast, estimates of the other economic integration variables suggest that regional dependence on international trade and direct investment from abroad and geographical proximity to the EU do not significantly affect the decision-making of Russian entrepreneurs who consider new entry to the market. On the other hand, the estimation results in Table 3.3 demonstrate that the destiny of Russian firms is nowadays deeply connected with the world economic dynamism. Indeed, not only the world oil price but also the other four economic integration variables are estimated with a significant coefficient, implying that the 2008 financial shock and subsequent crises greatly damaged Russian businesses as witnessed by Iwasaki (2014) in the case of large and medium-sized industrial companies and by Sprenger (2014) in the case of former socialist enterprises.

Many estimates of the control variables are significant, which corresponds to our predictions: medium-term economic growth encourages firm creation and, at the same time, keeps existing organizations alive. Intensive inter-firm competition blocks new comers and evicts poorly performing companies from the market. High market density is a key promoting factor for both firm entry and exit. In regions with hard climate conditions, firms tend to stay in the market probably due to high initial sunk costs.

As a next step, we addressed the issue of heterogeneity of Russian regions. It is argued that Russia is a huge country and hence there exists a great variation among regions in terms of the socio-economic systems as well as the market/ industrial structure. To examine possible influence of regional heterogeneity, we re-estimated Model [4] in Table

3.2 and Model [2] in Table 3.3 by dividing observations into four subsample groups taking historical and geographical similarities of the federal districts into consideration.

The results are reported in Table 3.4. The statistical significance of the key variables is remarkably different between the subsamples, implying that the system of firm creation and destruction is indeed manifold across Russian regions. The world oil price, however, takes a significant and positive coefficient in all the eight models corresponding to the above estimation results. The surprisingly robust estimate of the world oil price suggests the possibility that every Russian region is extremely sensitive to a global crisis and, accordingly, the regeneration of Russian firms was greatly damaged during the recent period.

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Table 3.1. Definition and descriptive statistics

Variable group and name	Additional definition	Descriptive statistics					Source
		Mean	S.D.	Median	Max.	Min.	
Firm entry and exit variables							
Log of firm entry	Log of number of newly established firms per 1,000 organizations	4.50	0.21	4.50	5.52	3.57	Rosstat
Log of firm exit	Log of number of liquidated firms per 1,000 organizations	4.07	0.50	4.07	5.66	1.36	Rosstat
Institutional variables							
Log of duration of a lawsuit at a regional arbitration court (mean)	Data during 2007-2011	4.26	0.22	4.23	5.53	3.80	Dmitrieva et al. (2012)
Log of duration of a lawsuit at a regional arbitration court (median)	Data during 2007-2011	4.04	0.19	4.07	4.68	3.37	Dmitrieva et al. (2012)
Acceptance rate of petition by regional arbitration courts (%)	Data in 2014	94.75	2.21	95.10	98.54	87.70	Federal Arbitration court
Log of lawsuit application number to regional arbitration courts per 1,000 organization	Data in 2014	5.96	0.41	5.92	7.04	5.02	Federal Arbitration court
Expert criminal risk ranking	Lagged 3 year moving average	43.19	21.48	43.33	87.00	1.33	Expert rating agency
Economic integration variables							
Log of world oil price	Log of simple average of spot prices of Dated Brent, West Texas Intermediate, and the Dubai Fateh computed using monthly data	4.51	0.18	4.58	4.65	4.12	IMF Commodity Price Database
Total trade in % of GRP	Lagged 3 year moving average	23.85	21.33	17.27	133.93	0.03	Rosstat
FDI inflow in % of GRP	Lagged 3 year moving average	3.82	5.85	2.02	68.59	0.00	Rosstat
Log of direct distance from Brussels	Distance from region capital in kilo meters	8.11	0.44	7.99	9.04	7.04	Authors' calculation
Control variables							
GRP growth rate (%)	% to previous year; lagged 3 year moving average	3.98	3.49	3.80	16.27	-7.27	Rosstat
Log of number of credit organizations and their branches per 100,000 residents	Lagged 3 year moving average	0.99	0.49	0.97	2.61	-2.48	Rosstat
Log of number of PCs with internet connection per 100 workers	Lagged 3 year moving average	2.48	0.50	2.54	3.90	0.29	Rosstat
Log of number of firms and organizations per 10,000 residents	Lagged 3 year moving average	5.49	0.40	5.49	6.95	4.20	Rosstat
Log of population density	Per km ² ; lagged 3 year moving average	2.71	1.79	3.10	8.43	-2.65	Rosstat
Average temperature in January	In centigrade; lagged 3 year moving average	-12.29	7.67	-10.87	1.40	-34.10	Rosstat
Time trend dummy	2008=0	3.00	2.00	3.00	6.00	0.00	Authors' calculation

Rosstat (<http://www.gks.ru/>)

Federal Arbitration court (<http://www.arbitr.ru/>)

Expert rating agency (<http://www.raexpert.ru/>)

IMF Commodity Price Database (<http://www.imf.org/external/np/res/commmod/index.aspx/>)

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Table 3.2. Panel data estimation of firm entry model in Russian regions

Dependent variable	Log of firm entry				
Estimation period	2008-2014				
Target regions	All regions				
Estimator	Random-effects	Random-effects	Random-effects	Random-effects	Fixed-effects
Model	[1]	[2]	[3]	[4]	[5]
Institutional variables					
Log of duration of a lawsuit at a regional arbitration court (mean)	-0.1148 (-0.960)				
Log of duration of a lawsuit at a regional arbitration court (median)		-0.0227 (-0.120)			
Acceptance rate of petition by regional arbitration courts (%)			-0.0184 * (-1.810)		
Log of lawsuit application number to regional arbitration courts per 1,000 organization				-0.1705 *** (-2.820)	
Expert criminal risk ranking	-0.0004 (-0.800)	-0.0004 (-0.800)	-0.0003 (-0.610)	-0.0002 (-0.460)	-0.0009 * (-1.790)
Economic integration variables					
Log of world oil price	0.4424 *** (14.850)	0.4425 *** (14.970)	0.4161 *** (13.360)	0.4164 *** (13.610)	0.4217 *** (14.530)
Total trade in % of GRP	-0.0013 (-1.460)	-0.0013 (-1.520)	-0.0011 (-1.040)	-0.0012 (-1.120)	-0.0007 (-0.550)
FDI inflow in % of GRP	-0.0015 (-0.740)	-0.0016 (-0.780)	-0.0014 (-0.620)	-0.0016 (-0.680)	-0.0012 (-0.450)
Log of direct distance from Brussels	0.1453 (0.870)	0.1187 (0.690)	0.1285 (0.760)	0.1299 (0.840)	
Control variables					
GRP growth rate (%)	0.0137 *** (6.900)	0.0136 *** (6.850)	0.0122 *** (4.450)	0.0118 *** (4.330)	0.0104 *** (4.280)
Log of number of credit organizations and their branches per 100,000 residents	0.0478 (0.750)	0.0406 (0.620)	-0.1032 (-1.530)	-0.0976 (-1.530)	-0.1923 * (-1.690)
Log of number of PCs with internet connection per 100 workers	0.2361 * (1.800)	0.2307 * (1.730)	0.1647 (1.120)	0.1492 (1.040)	0.1369 (1.020)
Log of number of firms and organizations per 10,000 residents	-0.3374 *** (-3.270)	-0.3517 *** (-3.470)	-0.2732 ** (-2.230)	-0.3032 ** (-2.460)	-0.7550 *** (-5.310)
Log of population density	0.0817 *** (4.320)	0.0764 *** (4.070)	0.0738 *** (5.070)	0.0556 *** (4.150)	0.1892 (0.280)
Average temperature in January	0.0024 (0.820)	0.0025 (0.870)	-0.0021 (-0.620)	-0.0016 (-0.500)	-0.0030 (-0.850)
Time trend dummy	-0.0766 *** (-3.280)	-0.0759 *** (-3.210)	-0.0718 *** (-2.710)	-0.0686 *** (-2.640)	-0.0702 *** (-2.700)
Constant term	3.0643 ** (2.290)	2.9831 ** (2.230)	4.5010 ** (2.360)	4.0051 *** (2.750)	6.2841 *** (3.370)
Control for district-level fixed-effects	Yes	Yes	Yes	Yes	No
Control for individual effects of regions	Yes	Yes	Yes	Yes	Yes
<i>N</i>	563	563	576	576	576
<i>R</i> ²	0.28	0.26	0.29	0.31	0.51
Breusch-Pagan test ^a	481.18 ***	491.66 ***	422.07 ***	407.13 ***	430.93 ***
Hausman-test ^b	-	-	-	-	154.50 ***
Wald test/F test (χ^2) ^c	872.52 ***	881.37 ***	677.00 ***	598.94 ***	57.26 ***

Notes:

a. Null hypothesis: The variance of regional individual effects is zero.

b. Null hypothesis: Random-effects assumption is valid.

c. Null hypothesis: All coefficients are zero.

Figures in parentheses beneath regression coefficients are t statistics computed basing on robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: Authors' estimation. See Table X for the definitions and descriptive statistics of the variables used in the estimation.

Table 3.3. Panel data estimation of firm exit model in Russian regions

Dependent variable	Log of firm exit				
Estimation period	2008-2014				
Target regions	All regions				
Estimator	Random-effects	Random-effects	Random-effects	Random-effects	Fixed-effects
Model	[1]	[2]	[3]	[4]	[5]
Institutional variables					
Log of duration of a lawsuit at a regional arbitration court (mean)	-0.4439 ** (-2.370)				
Log of duration of a lawsuit at a regional arbitration court (median)		-0.6972 *** (-3.190)			
Acceptance rate of petition by regional arbitration courts (%)			-0.0341 ** (-2.180)		
Log of lawsuit application number to regional arbitration courts per 1,000 organization				0.1286 (1.250)	
Expert criminal risk ranking	-0.0025 ** (-2.090)	-0.0023 ** (-1.980)	-0.0023 ** (-1.990)	-0.0019 * (-1.640)	-0.0018 * (-1.770)
Economic integration variables					
Log of world oil price	0.6838 *** (7.760)	0.6796 *** (7.790)	0.7019 *** (8.090)	0.7029 *** (8.190)	0.6603 *** (7.560)
Total trade in % of GRP	-0.0037 *** (-3.370)	-0.0028 *** (-2.630)	-0.0035 *** (-3.190)	-0.0035 *** (-3.060)	-0.0035 * (-1.640)
FDI inflow in % of GRP	0.0117 *** (2.740)	0.0119 *** (2.950)	0.0082 * (1.640)	0.0095 * (1.880)	0.0104 ** (2.090)
Log of direct distance from Brussels	-0.3021 (-1.490)	-0.1465 (-0.730)	-0.3574 * (-1.740)	-0.4942 ** (-2.280)	
Control variables					
GRP growth rate (%)	-0.0288 *** (-5.030)	-0.0294 *** (-5.040)	-0.0307 *** (-5.560)	-0.0302 *** (-5.660)	-0.0274 *** (-4.390)
Log of number of credit organizations and their branches per 100,000 residents	0.0719 (0.590)	0.0821 (0.710)	-0.0662 (-0.550)	-0.0452 (-0.360)	0.1927 (1.270)
Log of number of PCs with internet connection per 100 workers	-0.2784 * (-1.770)	-0.2533 (-1.540)	-0.2187 (-1.350)	-0.2312 (-1.450)	-0.1517 (-0.970)
Log of number of firms and organizations per 10,000 residents	0.3455 ** (2.240)	0.3395 ** (2.270)	0.2623 * (1.840)	0.3067 * (1.840)	0.3301 (0.570)
Log of population density	0.0695 *** (3.190)	0.0675 *** (3.300)	0.0526 ** (2.390)	0.0499 ** (2.140)	2.0269 (1.300)
Average temperature in January	-0.0265 *** (-4.080)	-0.0269 *** (-4.340)	-0.0259 *** (-3.720)	-0.0253 *** (-3.690)	-0.0456 *** (-4.840)
Time trend dummy	0.0937 *** (2.720)	0.0897 *** (2.580)	0.0771 ** (2.130)	0.0811 ** (2.250)	0.0742 ** (1.970)
Constant term	3.3873 ** (1.990)	3.0776 * (1.790)	5.6176 ** (2.410)	2.4230 (1.370)	-6.6001 (-1.050)
Control for district-level fixed-effects	Yes	Yes	Yes	Yes	No
Control for individual effects of regions	Yes	Yes	Yes	Yes	Yes
<i>N</i>	562	562	575	575	575
<i>R</i> ²	0.43	0.44	0.42	0.41	0.46
Breusch-Pagan test ^a	49.88 ***	39.46 ***	42.14 ***	48.34 ***	53.04 ***
Hausman-test ^b	-	-	-	-	32.37 ***
Wald test/F test (χ^2) ^c	557.34 ***	538.54 ***	531.72 ***	511.81 ***	42.58 ***

Notes:

a. Null hypothesis: The variance of regional individual effects is zero.

b. Null hypothesis: Random-effects assumption is valid.

c. Null hypothesis: All coefficients are zero.

Figures in parentheses beneath regression coefficients are t statistics computed basing on robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: Authors' estimation. See Table X for the definitions and descriptive statistics of the variables used in the estimation.

Table 3.4. Examination of heterogeneity among Russian regions

Firm entry				
Dependent variable	Log of firm entry			
Estimation period	2008-2014			
Target regions	North Caucasus and Southern Districts	Central and Northwest Districts	Volga and Urals Districts	Siberian and Far East Districts
Estimator	Pooling OLS	Random-effects	Random-effects	Random-effects
Model	[1]	[2]	[3]	[4]
Institutional variables				
Log of lawsuit application number to regional arbitration courts per 1,000 organization	0.0360 (0.330)	-0.2088 ** (-1.990)	-0.0954 (-0.530)	-0.2357 *** (-3.730)
Expert criminal risk ranking	0.0028 (1.160)	-0.0002 (-0.250)	-0.0001 (-0.150)	-0.00037 (-0.610)
Economic integration variables				
Log of world oil price	0.5613 *** (4.400)	0.4811 *** (9.000)	0.4131 *** (9.670)	0.3730 *** (6.490)
Total trade in % of GRP	-0.0051 ** (-2.470)	0.0001 (0.060)	0.0032 (1.210)	0.0000 (-0.040)
FDI inflow in % of GRP	-0.0307 (-1.050)	-0.0048 (-0.960)	-0.0070 (-1.280)	0.0001 (0.070)
Log of direct distance from Brussels	-0.4690 (-0.500)	0.6934 *** (3.230)	-0.1648 (-0.270)	0.1763 (1.210)
Control variables				
GRP growth rate (%)	0.0227 * (1.740)	0.0070 ** (2.040)	0.0146 *** (3.760)	0.0095 *** (3.060)
Log of number of credit organizations and their branches per 100,000 residents	-0.0409 (-0.610)	0.0298 (0.240)	0.1291 (0.930)	-0.1484 *** (-2.820)
Log of number of PCs with internet connection per 100 workers	-0.0054 (-0.040)	-0.1838 * (-1.750)	-0.0993 (-0.650)	-0.0021 (-0.040)
Log of number of firms and organizations per 10,000 residents	-0.1159 (-0.890)	-0.1930 (-1.430)	-0.1216 (-0.730)	-0.1013 (-1.200)
Log of population density	0.2299 *** (3.730)	0.0703 *** (2.670)	0.0334 (0.720)	0.0660 ** (2.540)
Average temperature in January	-0.0408 *** (-2.770)	0.0179 *** (3.430)	0.0025 (0.750)	-0.0101 *** (-2.820)
Time trend dummy	-0.0233 (-0.690)	0.0062 (0.290)	0.0027 (0.080)	-0.0563 *** (-4.990)
Constant term	5.1432 (0.680)	-0.2498 (-0.120)	5.2981 (0.880)	3.3762 ** (2.130)
Control for district-level fixed-effects	Yes	Yes	Yes	Yes
Control for individual effects of regions	No	Yes	Yes	Yes
<i>N</i>	90	203	140	143
<i>R</i> ²	0.49	0.33	0.22	0.67
Breusch-Pagan test ^a	0.00	206.42 ***	55.14 ***	26.41 ***
Wald test/F test (χ^2) ^b	6.48 ***	377.07 ***	2207.91 ***	1766.72 ***

Notes:

a Null hypothesis: The variance of regional individual effects is zero.

b Null hypothesis: All coefficients are zero.

Figures in parentheses beneath regression coefficients are t statistics computed basing on robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: Authors' estimation. See Table X for the definitions and descriptive statistics of the variables used in the estimation.

Firm entry and exit during a crisis period, evidence from Russian regions

Firm exit

Dependent variable	Log of firm exit			
Estimation period	2008-2014			
Target regions	North Caucasus and Southern Districts	Central and Northwest Districts	Volga and Urals Districts	Siberian and Far East Districts
Estimator	Pooling OLS	Random-effects	Random-effects	Pooling OLS
Model	[1]	[2]	[3]	[4]
Institutional variables				
Log of duration of a lawsuit at a regional arbitration court (median)	-0.5783 * (-1.670)	-0.7549 ** (-2.250)	-1.1080 * (-1.770)	-0.1469 (-0.470)
Expert criminal risk ranking	-0.0049 (-1.150)	-0.0039 * (-1.800)	-0.0059 *** (-2.750)	-0.0005 (-0.260)
Economic integration variables				
Log of world oil price	0.8414 ** (2.530)	0.4158 *** (3.230)	0.5878 *** (3.060)	0.7513 *** (4.310)
Total trade in % of GRP	0.0004 (0.060)	0.0008 (0.350)	-0.0097 * (-1.830)	-0.0052 *** (-2.660)
FDI inflow in % of GRP	0.0061 (0.110)	-0.0055 (-0.470)	0.0274 * (1.660)	0.0102 *** (3.010)
Log of direct distance from Brussels	4.4697 ** (2.160)	-0.5696 (-1.110)	1.7801 * (1.680)	0.0310 (0.080)
Control variables				
GRP growth rate (%)	-0.0413 ** (-2.310)	-0.0397 *** (-3.860)	-0.0209 (-1.590)	-0.0090 (-0.850)
Log of number of credit organizations and their branches per 100,000 residents	-0.9893 * (-1.870)	0.1923 (1.130)	0.7060 *** (2.930)	0.1871 (1.240)
Log of number of PCs with internet connection per 100 workers	0.8113 ** (2.160)	-0.4048 * (-1.850)	-0.8634 *** (-2.930)	-0.6831 *** (-5.490)
Log of number of firms and organizations per 10,000 residents	0.9106 ** (2.190)	0.0100 (0.050)	0.7951 *** (2.910)	0.4955 *** (3.770)
Log of population density	0.4113 ** (2.510)	0.1487 *** (3.880)	0.2502 *** (2.920)	0.1045 * (1.920)
Average temperature in January	-0.0566 ** (-2.010)	-0.0796 *** (-5.550)	-0.0276 ** (-2.040)	-0.0118 (-1.140)
Time trend dummy	-0.1791 ** (-2.190)	0.1133 ** (2.270)	0.2206 *** (3.450)	0.1768 *** (6.520)
Constant term	-39.5232 ** (-2.240)	9.1650 *** (2.620)	-13.0383 * (-1.760)	-2.0756 (-0.520)
Control for district-level fixed-effects	Yes	Yes	Yes	Yes
Control for individual effects of regions	No	Yes	Yes	No
<i>N</i>	84	196	140	142
<i>R</i> ²	0.58	0.52	0.50	0.48
Breusch-Pagan test ^a	0.00	3.45 **	1.84 *	0.19
Wald test/F test (χ^2) ^b	4.77 ***	369.94 ***	444.54 ***	10.09 ***

Notes:

a Null hypothesis: The variance of regional individual effects is zero.

b Null hypothesis: All coefficients are zero.

Figures in parentheses beneath regression coefficients are t statistics computed basing on robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: Authors' estimation. See Table X for the definitions and descriptive statistics of the variables used in the estimation.

Robustness check

In the previous subsection we mainly utilized a random-effects model to obtain estimates of the time-invariant variables and checked the statistical robustness of the time-variant variables by estimating a fixed-effects model. As an additional robustness check, we also conducted the estimation using a population-average estimator, a between-effects estimator, a Hausman–Tylor estimator and a system GMM estimator, and found no remarkable differences from the estimation results reported in Tables 3.2, 3.3, and 3.4¹².

Furthermore, we also carried out a supplementary estimation, in which various sample restrictions were placed on the regression models and confirmed that these sample restrictions do not substantially change our major empirical findings. More specifically, supplementary regressions were conducted with the following five settings: (a) excluding Moscow and St. Petersburg, which are under direct control of the Federal government (i.e., federal cities), from observations; (b) excluding so-called “resource-rich” regions from observations; (c) dividing observations into those for the years of 2008–2011 and those for the years of 2012–2014; (d) limiting regions to those with FDI in % of GRP within the mean ± 1 standard deviation; (e) limiting regions to those with total trade in % of GRP within the mean ± 1 standard deviation.

The above findings led us to the judgment that the estimation results reported in this paper are robust across the various specifications, apart from the regional heterogeneity discussed in the previous subsection.

¹² The Hausman–Tylor and system GMM estimations were attempted to estimate and endogenize non-lagged time-variant independent variables.

CONCLUSION

This paper is based upon a rich and unpublished panel dataset of regional-level data for the period 2008–2014. Our regression analysis gives a special attention to two aspects: institutional failures and the recent economic crises and downturns that characterize the period of investigation. More specifically, we take the natural logarithm of firm entry or exit rate as the dependent variable and focus on two explanatory sets of variables: four proxies for the efficiency of the judiciary system which are provided by Dmitrieva et al. (2012) and the federal arbitration court, and variables that measure the extent to which Russian firms are integrated in the world economy: the natural logarithm of world oil price, total trade volume in percent of GRP, inflow of FDI in % of GRP and finally the natural logarithm of the distance between Brussels and the capital cities of Russian regions.

The results lead us to the overall conclusion that the Russian economy functions within a legal, institutional and political environment that hinders the competition among firms, which is detrimental for economic development. On top of that, corruption and vested interests complicate furthermore the overall framework where private companies are forced to operate. As a result, entry rates of new businesses are declining over the period of the analysis, while the number of firms leaving the market is increasing. This is the case, in spite of already low entry rates as compared to other transitional economies.

More specifically, the entry and exit rates of businesses depend upon the efficiency of the judiciary system in resolving disputes related to the non-compliance with contracts and the non-payment of arrears. The resulting uncertainty and instability amplified by discretionary bureaucratic practices of public administrations distort dramatically the economic governance principles at all levels. In terms of entry/exit of businesses, this

translates into a chaotic evolution of the two rates, with successive peaks and bottoms over the period.

Two major external factors bring additional menaces to the already fragile economic conditions. Firstly, Russian firms, mainly SMEs, are highly sensitive to the variation of the world oil price, regardless of their geographical location and specialization. The oil price is the only variable pertaining to the integration of Russia in the world economy which is robustly related to firms' entry and exit. Our findings have two policy implications, namely that the oil curse can be a blessing if the rent is not a source of widespread corruption and does not impede the development of other sectors employing entrepreneurs and workers; and a rule of the law favourable to the emergence of a sound business environment is key to allow SMEs to enter/exit the market in a creative way. Russian economy, based essentially on oil and gas related activities, is therefore insufficiently diversified to cope with the negative impact of falling prices of these natural resources.

No after-oil strategic perspectives of development exist, which will definitely have serious implications in the future. The second important external factor is related to the vulnerability of the economy to world crises. Although the degree of integration of Russian economy into the global economy is relatively low, the 2008 crisis did have impact on the entry and exit of Russian businesses.

The internal and external factors damaging the economic performance influence the firm creation and destruction at national, regional and district levels. Specifically, the entries are declining as a consequence of those factors while exits are increasing, which leads to a low survival rate of enterprises. This tendency is somehow attenuated in certain regions where the local governments are in political harmony with the central power, which

grants them some privileges to cope with the adverse effects of exogenous influences. Overall, the impact of external threats on various regions vary according to the degree of vulnerability to outside crises, which in turn depends on the extent to which a particular region is more or less isolated from the source of the crisis.

To conclude, the firm creation and firm destruction in Russia is a multifarious process, in particular at regional level. As a general rule, the medium-term perspectives of economic growth encourage the entries of new businesses, as it is common to all countries. At the same time, those perspectives keep alive the majority of existing organizations. Strong inter-enterprise competition limits the entry of newcomers and evicts poorly performing companies from the market. High market density represents a major promoting factor both for entries and exits.

APPENDIX 3.1. FIRM ENTRY RANKINGS

2008 Ranking		2014 Ranking		Change from 2008			
Rank	Entry rate	Region name	Entry rate	Ranking	Entry rate		
1	Chechen Republic	155.9	1	Republic of Ingushetia	249.5	79	174.2
2	Perm Territory	148.3	2	Republic of Tatarstan	120.9	14	-8.1
3	Sverdlovsk Region	147.7	3	Lipetsk Region	115.4	8	-18.1
4	Kemerovo Region	142.1	4	St. Petersburg	112.7	33	-0.4
5	Ivanovo Region	142	5	Voronezh Region	111.3	66	17.4
6	Chelyabinsk Region	137.4	6	Nizhny Novgorod Region	110.4	2	-24.9
7	Amur Region	136.5	7	Ivanovo Region	108.8	▲ 2	-33.2
8	Nizhny Novgorod Region	135.3	8	Samara Region	106.2	39	-3
9	Novosibirsk Region	134.7	9	Perm Territory	105.9	▲ 7	-42.4
10	Khabarovsk Territory	134.6	10	Sverdlovsk Region	105	▲ 7	-42.7
11	Lipetsk Region	133.5	11	Vologda Region	103.9	1	-28.5
12	Vologda Region	132.4	12	Republic of Udmurtia	103.2	52	-0.3
13	Belgorod Region	131	13	Belgorod Region	102.4	0	-28.6
14	Republic of Buryatia	130.2	14	Novosibirsk Region	102	▲ 5	-32.7
15	Volgograd Region	129.1	15	Krasnoyarsk Territory	101.6	4	-25.1
16	Republic of Tatarstan	129	16	Primorsky Territory	101.4	9	-19.9
17	Republic of Sakha (Yakutia)	128	17	Altai Territory	101.2	11	-18.6
18	Smolensk Region	126.8	18	Khabarovsk Territory	100.7	▲ 8	-33.9
19	Krasnoyarsk Territory	126.7	19	Kirov Region	99.3	30	-8.8
20	Kostroma Region	124.8	20	Yaroslavl Region	99.1	9	-20.4
21	Sakhalin Region	123.6	21	Republic of Buryatia	98.3	▲ 7	-31.9
22	Murmansk Region	123	22	Ulyanovsk Region	97.7	28	-10.4
23	Bryansk Region	122.3	23	Amur Region	97.2	▲ 16	-39.3
24	Vladimir Region	121.7	24	Kemerovo Region	94.6	▲ 20	-47.5
25	Primorsky Territory	121.3	25	Chelyabinsk Region	94.6	▲ 19	-42.8
26	Republic of Karelia	120.9	26	Omsk Region	93.1	5	-24.5
27	Tula Region	120.4	27	Penza Region	93.1	7	-22.6
28	Altai Territory	119.8	28	Tyumen Region	91.6	8	-22.2
29	Yaroslavl Region	119.5	29	Chuvash Republic	90.5	6	-24.2
30	Tambov Region	117.9	30	Moscow	90.4	12	-21.3
31	Omsk Region	117.6	31	Tambov Region	89.7	▲ 1	-28.2
32	Tomsk Region	117.5	32	Republic of Bashkortostan	88.4	11	-23.3
33	Republic of Tuva	117	33	Murmansk Region	87.9	▲ 11	-35.1
34	Penza Region	115.7	34	Republic of Mari El	87.9	7	-24.1
35	Chuvash Republic	114.7	35	Volgograd Region	87.4	▲ 20	-41.7
36	Tyumen Region	113.8	36	Irkutsk Region	87.3	8	-22.6
37	St. Petersburg	113.1	37	Smolensk Region	86.8	▲ 19	-40
38	Novgorod Region	113	38	Orenburg Region	86.2	7	-23.3
39	Orel Region	112.7	39	Bryansk Region	85.9	▲ 16	-36.4

Firm entry and exit during a crisis period, evidence from Russian regions

2008 Ranking		2014 Ranking		Change from 2008			
Rank	Entry rate	Region name	Entry rate	Ranking	Entry rate		
40	Republic of Daghestan	112.3	40	Vladimir Region	85.9	▲ 16	-35.8
41	Republic of Mari El	112	41	Tula Region	85.7	▲ 14	-34.7
42	Moscow	111.7	42	Jewish Autonomous Region	85.1	12	-22.5
43	Republic of Bashkortostan	111.7	43	Republic of Sakha (Yakutia)	84.9	▲ 26	-43.1
44	Irkutsk Region	109.9	44	Ryazan Region	84	13	-22.6
45	Orenburg Region	109.5	45	Tver Region	83.9	30	-0.6
46	Kaliningrad Region	109.4	46	Chechen Republic	82.4	▲ 45	-73.5
47	Samara Region	109.2	47	Republic of North Ossetia - Alania	82.3	18	-20.8
48	Kurgan Region	109.1	48	Yamal-Nenets Autonomous Area	80.1	4	-27.7
49	Kirov Region	108.1	49	Saratov Region	80	29	1.1
50	Ulyanovsk Region	108.1	50	Krasnodar Territory	79.7	8	-26.9
51	Kaluga Region	108	51	Republic of Karelia	79.5	▲ 25	-41.4
52	Yamal-Nenets Autonomous Area	107.8	52	Rostov Region	78.9	17	-18
53	Arkhangelsk Region	107.6	53	Kostroma Region	77.9	▲ 33	-46.9
54	Jewish Autonomous Region	107.6	54	Sakhalin Region	77.7	▲ 33	-45.9
55	Astrakhan Region	107.2	55	Kaliningrad Region	77.3	▲ 9	-32.1
56	Republic of Khakasia	107	56	Astrakhan Region	77.1	▲ 1	-30.1
57	Ryazan Region	106.6	57	Kursk Region	77.1	2	-28.8
58	Krasnodar Territory	106.6	58	Tomsk Region	76.7	▲ 26	-40.8
59	Kursk Region	105.9	59	Arkhangelsk Region	76.4	▲ 6	-31.2
60	Republic of Mordovia	105.4	60	Republic of Adygeya	76.3	7	-24.4
61	Moscow Region	104.2	61	Khanty-Mansi Autonomous Area - Yug	76.1	11	-16.3
62	Republic of Komi	104.2	62	Zabaikalsk Territory	75.6	1	-28.2
63	Zabaikalsk Territory	103.8	63	Republic of Khakasia	74.5	▲ 7	-32.5
64	Republic of Udmurtia	103.5	64	Kamchatka Territory	73.7	9	-17.6
65	Republic of North Ossetia - Alania	103.1	65	Nenets Autonomous Area	73.3	11	-11.1
66	Karachayevo-Circassian Republic	102.5	66	Republic of Daghestan	72.4	▲ 26	-39.9
67	Republic of Adygeya	100.7	67	Republic of Komi	72	▲ 5	-32.2
68	Kabardino-Balkarian Republic	98.9	68	Novgorod Region	71.3	▲ 30	-41.7
69	Rostov Region	96.9	69	Republic of Altai	70.3	1	-24.9
70	Republic of Altai	95.2	70	Moscow Region	69.7	▲ 9	-34.5
71	Voronezh Region	93.9	71	Orel Region	68.8	▲ 32	-43.9
72	Khanty-Mansi Autonomous Area - Yug	92.4	72	Kaluga Region	68.8	▲ 21	-39.2
73	Kamchatka Territory	91.3	73	Pskov Region	67.7	1	-20.4
74	Pskov Region	88.1	74	Republic of Mordovia	66.6	▲ 14	-38.8
75	Tver Region	84.5	75	Republic of Kalmykia	66.6	8	15.9
76	Nenets Autonomous Area	84.4	76	Kurgan Region	66.3	▲ 28	-42.8
77	Stavropol Territory	83.9	77	Kabardino-Balkarian Republic	59	▲ 9	-39.9
78	Saratov Region	78.9	78	Karachayevo-Circassian Republic	58.6	▲ 12	-43.9
79	Leningrad Region	77.4	79	Republic of Tuva	58.3	▲ 46	-58.7
80	Republic of Ingushetia	75.3	80	Magadan Region	57.9	1	-13.8
81	Magadan Region	71.7	81	Stavropol Territory	53.8	▲ 4	-30.1
82	Chukotka Autonomous Area	71.2	82	Leningrad Region	51.6	▲ 3	-25.8
83	Republic of Kalmykia	50.7	83	Chukotka Autonomous Area	49.8	▲ 1	-21.4

APPENDIX 3.2. FIRM EXIT RANKINGS

2008 Ranking		2014 Ranking		Change from 2008	
Region name	Exit rate	Region name	Exit rate	Ranking	Exit rate
1 Republic of North Ossetia —Alania	123.3	1 Tula Region	130.3	72	101.5
2 Republic of Altai	101.8	2 Moscow	120	78	98.3
3 Altai Territory	77.3	3 Jewish Autonomous Region	117.5	19	61.3
4 Chuvash Republic	75.4	4 Republic of Kalmykia	113.1	46	74.4
5 Omsk Region	72.7	5 Arkhangelsk Region	111.3	67	82.1
6 Sakhalin Region	70.5	6 Perm Territory	109.4	59	77.2
7 Kabardino-Balkarian Republic	69.4	7 Novosibirsk Region	109	5	43.7
8 Tver Region	68.7	8 Republic of Bashkortostan	103.9	16	48.6
9 Chechen Republic	67	9 St. Petersburg	103	73	83.9
10 Republic of Udmurtia	66.7	10 Yaroslavl Region	101.5	52	67.9
11 Tambov Region	65.8	11 Republic of Mari El	101.4	4	38.6
12 Novosibirsk Region	65.3	12 Penza Region	100.1	15	47.5
13 Zabaikalsk Territory	63.8	13 Kostroma Region	93.4	41	55.9
14 Kemerovo Region	63.3	14 Republic of Altai	93	▲ 12	–8.8
15 Republic of Mari El	62.8	15 Chechen Republic	90.9	▲ 6	23.9
16 Orenburg Region	62.3	16 Tambov Region	90.3	▲ 5	24.5
17 Republic of Ingushetia	61.3	17 Yamal-Nenets Autonomous Area	90.1	60	64.3
18 Lipetsk Region	59.1	18 Sverdlovsk Region	89.6	49	57.8
19 Republic of Tuva	58.3	19 Omsk Region	86.8	▲ 14	14.1
20 Bryansk Region	57.5	20 Chukotka Autonomous Area	86.5	21	43.5
21 Ulyanovsk Region	57.5	21 Kamchatka Territory	86.5	55	59.5
22 Jewish Autonomous Region	56.2	22 Ulyanovsk Region	85.5	▲ 1	28
23 Kurgan Region	55.7	23 Altai Territory	83.4	▲ 20	6.1
24 Republic of Bashkortostan	55.3	24 Zabaikalsk Territory	81.3	▲ 11	17.5
25 Pskov Region	55.1	25 Nenets Autonomous Area	80.9	31	45.4
26 Smolensk Region	54	26 Lipetsk Region	80.1	▲ 8	21
27 Penza Region	52.6	27 Kabardino-Balkarian Republic	78.9	▲ 20	9.5
28 Kursk Region	51.9	28 Murmansk Region	75	7	29.1
29 Volgograd Region	51.6	29 Vladimir Region	74.9	39	43.3
30 Novgorod Region	51.4	30 Samara Region	74.8	10	30.8
31 Stavropol Territory	48.9	31 Republic of Ingushetia	74.7	▲ 14	13.4
32 Voronezh Region	47.3	32 Chelyabinsk Region	74.2	19	35.7
33 Republic of Karelia	47.2	33 Kemerovo Region	73.7	▲ 19	10.4
34 Amur Region	46.7	34 Tver Region	73.5	▲ 26	4.8
35 Murmansk Region	45.9	35 Primorsky Territory	73.3	39	45.3
36 Kaliningrad Region	45.4	36 Republic of Sakha (Yakutia)	72.7	8	31.4
37 Khabarovsk Territory	45.3	37 Vologda Region	71.9	12	32.1
38 Republic of Mordovia	45	38 Kirov Region	71.7	8	31
39 Tomsk Region	44.6	39 Republic of North Ossetia —Alania	71	▲ 38	–52.3
40 Samara Region	44	40 Orenburg Region	70.7	▲ 24	8.4

Firm entry and exit during a crisis period, evidence from Russian regions

2008 Ranking		2014 Ranking		Change from 2008	
Rank	Exit rate	Region name	Exit rate	Ranking	Exit rate
41	Chukotka Autonomous Area	43	41 Tyumen Region	29	38.9
42	Saratov Region	42.8	42 Voronezh Region	▲ 10	23
43	Rostov Region	41.6	43 Amur Region	▲ 9	23
44	Republic of Sakha (Yakutia)	41.3	44 Republic of Tatarstan	15	34.6
45	Republic of Buryatia	41	45 Nizhny Novgorod Region	2	25.5
46	Kirov Region	40.7	46 Republic of Tuva	▲ 27	7.6
47	Nizhny Novgorod Region	40.7	47 Saratov Region	▲ 5	22.8
48	Orel Region	40	48 Krasnoyarsk Territory	16	31.7
49	Vologda Region	39.8	49 Republic of Karelia	▲ 16	16
50	Republic of Kalmykia	38.7	50 Khabarovsk Territory	▲ 13	17
51	Chelyabinsk Region	38.5	51 Astrakhan Region	4	23.8
52	Ivanovo Region	38.2	52 Smolensk Region	▲ 26	5.7
53	Karachayevo-Circassian Republic	37.6	53 Kurgan Region	▲ 30	3.9
54	Kostroma Region	37.5	54 Volgograd Region	▲ 25	8
55	Astrakhan Region	36.1	55 Sakhalin Region	▲ 49	−11.2
56	Nenets Autonomous Area	35.5	56 Tomsk Region	▲ 17	14.6
57	Krasnodar Territory	35.5	57 Ivanovo Region	▲ 5	20.8
58	Ryazan Region	35.4	58 Rostov Region	▲ 15	16.1
59	Republic of Tatarstan	34.8	59 Orel Region	▲ 11	17.5
60	Irkutsk Region	34.4	60 Irkutsk Region	0	23.1
61	Magadan Region	34.2	61 Magadan Region	0	23.3
62	Yaroslavl Region	33.6	62 Belgorod Region	4	25.7
63	Republic of Daghestan	32.7	63 Leningrad Region	16	32.6
64	Krasnoyarsk Territory	32.5	64 Krasnodar Territory	▲ 7	20.8
65	Perm Territory	32.2	65 Ryazan Region	▲ 7	20.6
66	Belgorod Region	31.8	66 Republic of Mordovia	▲ 28	10.8
67	Sverdlovsk Region	31.8	67 Pskov Region	▲ 42	0.6
68	Vladimir Region	31.6	68 Chuvash Republic	▲ 64	−19.9
69	Republic of Komi	31.6	69 Republic of Khakasia	2	22.4
70	Tyumen Region	31.6	70 Bryansk Region	▲ 50	−4.8
71	Republic of Khakasia	30.7	71 Republic of Adygeya	7	27.5
72	Arkhangelsk Region	29.2	72 Kaliningrad Region	▲ 36	6.4
73	Tula Region	28.8	73 Republic of Udmurtia	▲ 63	−15.3
74	Primorsky Territory	28	74 Karachayevo-Circassian Republic	▲ 21	13.5
75	Kaluga Region	27.5	75 Republic of Komi	▲ 6	15.2
76	Kamchatka Territory	27	76 Republic of Buryatia	▲ 31	4.1
77	Yamal-Nenets Autonomous Area	25.8	77 Kaluga Region	▲ 2	14.9
78	Republic of Adygeya	25	78 Khanty-Mansi Autonomous Area — Yu	3	22.6
79	Leningrad Region	24.8	79 Republic of Daghestan	▲ 16	6.6
80	Moscow	21.7	80 Moscow Region	3	19.2
81	Khanty-Mansi Autonomous Area — Yu	19.6	81 Kursk Region	▲ 53	−15.2
82	St. Petersburg	19.1	82 Novgorod Region	▲ 52	−15.8
83	Moscow Region	17.6	83 Stavropol Territory	▲ 52	−13.6

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CONCLUSION

This paper has taken a multi-dimensional approach to the question of regional integration by building up on the existing literature to identify new perspectives and methodologies on three distinct geographical areas: Central and Eastern Europe, North Africa and the Russian Federation. The analysis has focused on elements of productive knowledge, trade barriers and diplomacy as well as business creation in an attempt to understand how these interact within integrated economic spaces. Our results have provided significant outlooks on efficient forms of integration, identifying the distinct characteristics of each area but also investigating individual country components for a deeper knowledge of specificities and their evolution in the last decades.

Our first chapter has focused on impacts of regional integration on productive knowledge and how countries within an integrated economic space can benefit from the positive externalities on human capital from the other states within the region. As a direction of study, we investigated the benefits of EU accession on the Central and Eastern European (CEE) economies that joined the Union in 2004 and 2006. To assess the effects on productive knowledge, the evaluation centred on the impact of accession on the complexity of the product export space of these countries. Our methodology combined the index of Economic Complexity (ECI) with a synthetic control evaluation which simulates the path of complexity that our group of would have taken had it not joined the EU. Synthetic counterparts were created by using an optimisation algorithm based on a series of macroeconomic predictor variables that assigns weights for each country from a donor pool of comparable economies that have not been subject to treatment (i.e. not joined the EU). In other words, the simulated path of complexity is a weighed combination of the realised paths of other non-EU countries in the time period before accession and provides a close representation of what a new EU member would have taken had it not joined. By

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comparing the synthetic counterpart to the actual realised complexity of each CEE countries, we were able to determine the gap of complexity between the two scenarios over the years after their accession (up until 2015) and identify the countries for which access to the European Union provided a tangible difference to their export product space. Our results indicate that entering the EU was beneficial on the complexity of a distinct group of states where a significant gap exists between the realised and synthetic paths, an indication that their economies have become more complex than in the counterfactual scenario. These results are significant for the Baltic States (Estonia, Lithuania, Latvia) as well as Romania and Hungary with the notable characteristic that this group of countries have started with relatively low levels of complexity prior to their accession. The effects are less notable for Czech Republic, Poland, Slovakia, Slovenia whose initial level of complexity was relatively higher, resulting in a lower gap between actual and synthetic paths. These results seem to point at a convergence effect observed for ECI where accession to EU has benefited most to the countries that had initially less complex economies. On the other hand, for countries who were already exporting complex products prior to EU accession, marginal effects were lower. From these results, EU accession can be seen as a catalyst for economic complexity that provides a significant initial uplift for countries with an undeveloped product export space. The only exception to our sample is Bulgaria who maintained low levels of economic complexity both before and after accession with no significant difference between actual and synthetic paths.

In our second chapter, we have taken a wider geographical reach to regional integration by extending our area to include North Africa and the rest of Europe along our CEE economies. In this space, our focus has been on identifying determinants of bilateral trade between the countries of the area and how mechanisms of trade facilitation operate to promote imports and export flows. In particular, our approach attempts at understanding

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trade facilitation through the lens of diplomatic presence and how the existence of ambassadorial agents affects the trading flows between two countries. To achieve this perspective, we develop an econometric model which implements a fixed-effects gravity equation to which we integrate the conventional indicators of the trading literature alongside a group of selected variables that reflect the diplomatic relationship between a set of trading partners. These include the direct monetary cost and fees associated with the export and import of traded goods as well as other frictional elements linked to the action of trading abroad: the cost related to the export and import merchandise, the number of legal documents required, and the average time needed to ship a container in each country. To these are added a group of trade facilitation indicators measuring the quality of the logistic, infrastructure and services related to trading activities. In the second stage of our methodology looks at assessing the impact of diplomacy on trade, by accounting for bilateral representation within a trading country which we define as the appointment of an official (Charge d'affaire or Ambassador) from another country that promote and defend national interests. Through this system, we were able to quantify and assess how diplomatic presence affects trading relations. For the initial analysis of trade facilitation performances, our model validates the standard results of international trade theory with robust estimates of distance, cost of trading and logistic performance on the promotion of exports. From the perspective of diplomacy, our results indicate that the presence of an Ambassador is highly significant across all specifications, pointing towards a positive impact of the foreign service on facilitating trade. The results are valid across bilateral exports, with a representative of foreign affairs improving trade volumes both for the importer and exporter country. Overall, the observed difference in trade between North African countries and Central and Eastern European countries can be attributed to the quality of both soft and

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hard infrastructure in these countries, with a significant role of diplomacy towards the improvement of trade logistics.

Our third and final chapter has proposed to analyse the role of regional integration occurring within a larger state by taking the Russian federation as an example to examine the role of institutional failures on business creation. Using a panel dataset presenting the evolution both firm entries and exits over all Russian regions between 2008-2014, we constructed a regression analysis incorporating proxies of the efficiency of the country's judiciary system and the federal arbitration court as well as variables measuring the integration of Russian firms within the global economy, including the world oil price, trade volume, foreign direct investment and distance to Brussels. Our regression results have shown how entry and exit rates of Russian firms depend on an efficient rule of law, including the duration of lawsuit applications and the acceptance rate of petition by regional arbitration courts. The observed decline in entry rates over the period of our analysis and the parallel increase in firms leaving the markets can therefore be attributed as being a result of Russian economy functioning within a business environment that is detrimental to competition among firms, both in terms of legal, institutional and political perspectives. While these results are manifold when looking at the detailed breakdown across different regions, we found a consistently significant impact of the world oil price on the creation of Russian businesses across all regions, a strong indication that oil prices are a key variable pertaining to the integration of Russia in the world economy. These aspects have been tied to the question of energy in a broader scope how the dependence of Russia on natural oil and gas exhibits aspects of volatility on business creation and an overall weakened resilience of the economy to external shocks.

POLICY RECOMMENDATIONS

The purpose of this paper has been to identify new ways in approaching the question of integration in an attempt to broaden perspectives on what should be examined in its context. From a policy view, we hope to shed some light on the discussion of regional integration and the relative role of policy tools, both at the individual country and regional union level, to promote effective development of shared economic spaces.

On the question of trade, we recognise the recommendations of the previous literature on how major aspects of trade facilitation can provide a determinant role in the positive effects of a region's integration within larger economic markets. Policies related to the reduction of tariffs and the improvement of logistical infrastructure should continue to be encouraged, particularly for regions where they contribute to the high cost of trade and impede efficient trade both for internal and external markets. To these recommendations, we add diplomatic representation as an additional step towards ensuring efficient and continued political and commercial relationships within integrated economic spaces. The use of a well-maintained dialog between partner states is a fundamental practice that needs more attention from a policy making perspective in order to ensure that the trading capacities of a particular region are achieved at their fullest. This paper has demonstrated how diplomatic representation stands at the core of developed commercial exchanges through the significant presence of ambassadorial agents on bilateral imports and exports. Particularly for spaces with low representation, as with North African countries, there is significant potential to enhance trading nodes by broadening the policy perspective beyond liberalisation and the reduction of tariffs. Trade agreements for developing countries and the development of regional unions between them would benefit from being supplemented with discussions on the opening of embassies in partner countries in order to ensure a sustained development of international negotiations.

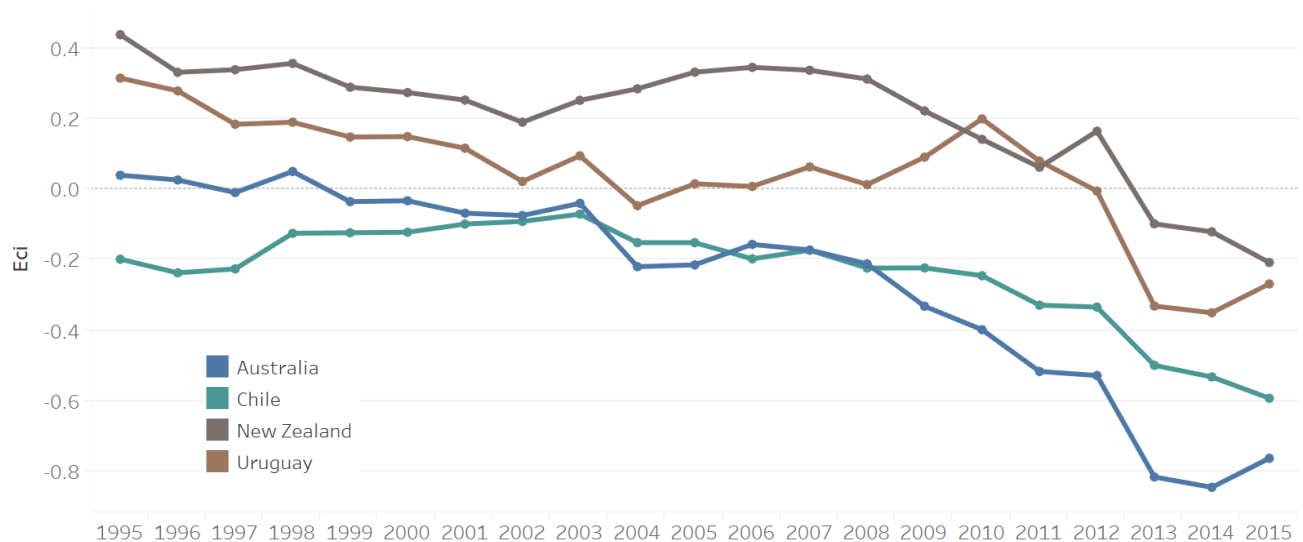
On the other hand, the question of trade within a regionally integrated area inherently entails discussions about the composition of the exchanged goods and how each country's production positions itself within the larger market. With the most recent developments of

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international trade theory, we recognise the need of new ways of looking at trade components to acquire better perspectives of the composition of an individual country's exports. In this regard, our study has paved the way for a more detailed examination of the specific mechanisms of integrated markets on leveraging knowledge for product manufacturing and exports. In particular, the nature of the exported products themselves plays an important role in the ability of a country to maintain a sustainable growth path in order to remain competitive in future generations. Equally significant is the detailed understanding of where an economy's production space situates itself with respect to its trading partners and the rest of the world in order to identify potentials of comparative advantage. The appearance of new indices like the Economic Complexity Index used in this paper provides with a powerful and parsimonious source of information to classify countries by their sector of specialisation; Economic Complexity allows the understanding of the degree of sophistication of a country's production and exporting space but also provides intuition of its economy's ability to produce exclusive products. From an individual country perspective, governmental policies should be aimed at targeting the development of sectors with high levels of complexity and pushing existing patterns of specialisation to the effective use of productive capabilities that are in line with their current structures. The process should also involve employment policies to focus on a skilled and internationally competitive workforce as opposed to just providing low-cost labour. The era of globalisation has opened numerous markets to the international scene that can offer relatively lower cost on a variety of products. Countries within regionally integrated spaces would therefore benefit from policies focused on the manufacturing expertise of complex products in order to provide a competitive advantage to their immediate neighbours. Within this context, our analysis has shown how the European Union acted as an accelerating force for the development of high-end products within the new joining members. The success stories of countries like Romania and Hungary, who experienced substantial growth in their car manufacturing sector after their accession, are significant examples of how integration within an economic region can shift the labour focus of developing countries on targeting higher-end productions.

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It is worth noting that these recommendations do not only apply to developing countries; low levels of economic complexity can also be found in high-income states as well, particularly for Australia, New Zealand, Chile and Uruguay who recorded the highest decreases over the 1995-2010 period for the group.



The high dependence of these countries on Raw Materials (Australia and Chile) and Food (New Zealand and Uruguay) runs the risk of their export economy being overtaken by lowers costs from the developing space but also, in the former case, of a difficult transition of the energy sector in the coming decades. The question of energy attains a broader scope in the context of complexity as demonstrated by the decline of ECI observed in Russia and its close neighbours (Ukraine, Albania, Bulgaria) due to their ever-increasing reliance on sources of energy in the export space. The Baltic states have provided another interesting dimension to this intuition as our results have shown that while their levels of complexity have been somewhat stagnant over the last years, these countries would have experienced a similar decline in complexity had they not joined the EU. It is interesting to note all that these states have the common characteristic of being in the direct sphere of influence of the Russian Federation and how a major part of Baltic EU membership centred around the strategy of not letting their economies slip into a pure focus on natural resources. Particularly within the dialog of energy transition, complexity becomes a key factor in determining

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which countries are at risk of being overtaken by the development of renewables and limitations of future ecological agreements. Our econometric results in Chapter 3 have further accentuated this point by demonstrating the sensitivity of oil price on the creation of SMEs in Russia, a result that has affected every region regardless of their geography and specialisation. Having an economy essentially based on oil and gas related activities hinders economic integration both at the regional and global level and provides a negative outlook for countries that fail to diversify efficiently with destructive consequences on the business ecology. Such countries should instead focus on the development of alternative sectors employing entrepreneurs and workers, developing high-end skills and ensuring strategic perspectives of development for the post-oil future.

The above recommendations lie on the fundamental principles of the modern economy and must take place in conjunction with the traditional views of privatisation, structural reforms and compliance with high-level business standards to form a basis for sound and sustainable economic activity. Particularly for low to middle income countries, policy focus should also be geared towards ensuring that legal systems are compliant with Western Standards and are in place to tackle issues of widespread corruption. Such policies have been explored within this paper, where our results have shown the importance of promoting sound business environment with an efficient judiciary system to resolve disputes relating to non-compliance with contracts and non-payment of debts. Defective bureaucratic practices of public administrations can substantially distort the economic governance principles at all levels, often giving place to general uncertainty and instability within the state with resulting market volatilities and negative outlooks for foreign investment.

Overall, any state aiming at becoming a successful part of an integrated economic space should aim at favouring strategies targeting healthy business structures, research, development and innovation, trade-related reform as well as education targeted policies, which are all factors of developed productive knowledge and beneficial economic relationships within an economy and between trading partners. The responsibility of enforcing such policies also lies at the core of the overarching political system, as has been the case with the European Union in promoting strategies of liberalisation, free movement of goods and people as well as human capital. Having said that, it is difficult to ignore the recent turmoil experienced within the European Union, the world's largest

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shared market and also the one where integration has happened at the fastest pace. From the economic crisis driven by the Greek debt to the decision of the United Kingdom to leave the Union through the 2016 referendum, the numerous complications that have arisen have brought criticism both on the nature and the pace of how the European project was built. Integrating a country in a larger regional state ultimately means bringing its economy to a larger market, but it also entails the integration of its citizens, along with their history and culture. The recent rise in populist opinions in the Eastern European economies and to a larger extent in the continent as a whole, shows the limits of where fundamental views can diverge and cause major strains on a cohesive political development. As a whole however, the European project has achieved its central goal of maintaining peace and integrity to European continent and provides a founding principle on how an area historically known for continuous conflict has come together into mutual agreement. Without exceptions, all members of the EU have not been involved in any form of armed conflict between themselves since its creation. The unparalleled achievement of the unique currency and monetary system has been a milestone of economic progress and new joining members have seen their standards of living grow with unprecedented rates. From that perspective, the future of the European experiment lies in its understanding how it can evolve to face the new rising challenges in order to continue to show the world the power behind a cohesive structure of states.

With this paper we hope to have shed a light on both the benefits of integration and best practices in ensuring sustained growth for these spaces in the future. The world is set for yet larger social and economic disruptions, both in terms of energy and demographics, to develop in the next decades and regions which aspire to come together under common frameworks are at an advantageous position to be able to draw inspiration from the existing integrated structures, in understanding how to uplift their capacity at mutual co-operation and defining their place within this future.

Summary

This thesis takes a cross-regional analytical approach of three distinct economic areas to evaluate productive knowledge and diplomacy in the context of regional integration alongside determinants of business creation. From the angle of European integration, we introduce a new synthetic control methodology to evaluate the impact of EU accession on the economic complexity index of new CEE member states its results indicating that accession to the EU acted as a catalyst for the productive knowledge of countries with low levels of complexity before accession, allowing a higher rate of development in the sophistication of their product export space. Expanding our analysis to include all European countries and North African states, we proceed in a second stage to analyse institutional and logistical infrastructure determinants of trade by extending the traditional Gravity model to incorporate elements of diplomacy (including the presence of embassies and ambassadors). Our results demonstrate the benefits of soft and hard infrastructure as well as diplomatic activity on the bilateral trade fixed effect CEE and North African countries, validating their importance of these variables as powerful drivers of regional integration. In a final part, we turn our analysis to the Russian Federation as a regional geography with a panel regression analysis of the determinants of firm entry and exit. The empirical evaluation concludes that institutional failures and the politico-economic environment exhibit statistically significant and economically meaningful effects both on the creation and destruction of Russian firms, with a robust estimate of the world oil price (irrespective of the difference in target regions) suggesting a possible high exposure of each Russian region to a global crisis.

Keywords: regional integration, economic complexity, synthetic control, gravity model, trade facilitation, firm entry, firm exit, institutions

Résumé

Cette thèse adopte une approche analytique interrégionale de trois régions économiques pour évaluer les connaissances productives et la diplomatie dans le contexte d'intégration régionale, et en parallèle, les déterminants de la création d'entreprises. Du point de vue de l'intégration européenne, nous introduisons une nouvelle méthodologie de contrôle synthétique pour évaluer l'impact de l'adhésion à l'UE sur l'indice de complexité économique des nouveaux États membres d'Europe centrale et orientale. Nos résultats indiquent que l'adhésion à l'UE a joué un rôle catalyseur pour la connaissance productive des pays portant de faibles niveaux de complexité avant l'adhésion, permettant un taux de développement plus élevé dans la sophistication de l'espace d'exportation de leurs produits. En élargissant notre analyse à tous les pays européens et aux États d'Afrique du Nord, nous procédons dans un deuxième temps à l'analyse des déterminants du commerce des infrastructures institutionnelles et logistiques en élargissant le modèle de Gravité pour y incorporer des éléments de diplomatie (notamment la présence d'ambassades et d'ambassadeurs). Nos résultats démontrent les avantages des infrastructures immatérielles et matérielles ainsi que de l'activité diplomatique sur le commerce bilatéral des PECO et de l'Afrique du Nord, confirmant l'importance de ces variables en tant que moteurs de l'intégration régionale. Dans une dernière partie, nous concentrons notre analyse sur Fédération de Russie en tant que région géographique en introduisant une régression panel des déterminants de l'entrée et de la sortie d'entreprises. Cette évaluation empirique conclut que les défaillances institutionnelles et l'environnement politico-économique ont des effets significatifs sur la création et la destruction d'entreprises russes, avec une estimation robuste du prix mondial du pétrole (quelle que soit la différence entre les régions cibles) suggérant une forte exposition de chaque région russe à une crise mondiale.

Mots-clés : intégration régionale, complexité économique, contrôle synthétique, modèle de gravité, facilitation des échanges, entrée d'entreprises, sortie d'entreprises, institutions