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Book Translations as Idea Flows: The Effects of the Collapse of Communism on the Diffusion of Knowledge

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ABSTRACT

We use book translations as a new measure of international idea flows and study the effects of Communism's collapse in Eastern Europe on these flows. Using novel data on 800,000 translations and difference-in-differences approaches, we show that while translations between Communist languages decreased by two thirds with the collapse, Western-to-Communist translations increased by a factor of four and quickly converged to Western levels. Convergence was more pronounced in the fields of applied and social sciences, and was more complete in Satellite and Baltic than in Soviet countries. We discuss how these patterns help us understand how repressive institutions and preferences towards Western European ideas shaped the international diffusion of knowledge.

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1. Introduction

Economists and economic historians have long recognized the importance of knowledge and ideas for growth and development, and the importance of institutions in shaping the international flow of ideas.[1] Nevertheless, there is little empirical work on idea flows, primarily because ideas are challenging to measure. In particular, it is challenging to capture the two main properties of ideas, namely non-rivalry (the use of an idea by one party in no way affects its simultaneous use by another) and disembodiment (in contrast to embodiment in purchased goods or equipment). We address this challenge by suggesting a new measure of the international flow of ideas and a setting in which to study the role of institutions in shaping the diffusion of ideas between countries.

Specifically, we use book translations as a measure of the international flow of ideas. Translations are an attractive measure of the diffusion of ideas because they are both non-rival and disembodied, and their key purpose is to transmit written ideas, information or knowledge between speakers of different languages. In the absence of translation, many ideas stored in words might never leave the language or country in which they were conceived. Of course, book translations are not the only way societies gain new knowledge, but they are one channel for the flow of pure ideas between linguistically distinct

[1] See, for example, Kuznets (1966), Mokyr (2003, 2009, 2010), Romer (1993, 2010), Klenow (2005), and Jones and Romer (2010).

groups, and are both quantifiable and classifiable by field and specific content.[2] Moreover, the types of ideas captured by translations are broad, ranging from technical ideas (such as in physics or engineering books), to ideas that are essentially social or cultural (such as in books on religion, philosophy, or literature). Finally, empirical analysis of translations is possible because systematic data on translations can be generated from national bibliographies.

We propose a natural setting to identify the effect of institutional change on idea flows, namely the collapse of Communism in Eastern Europe, and document how this institutional change affected flows of book translations. The collapse of Communism was a large shock that swiftly moved countries from the nearly complete isolation from Western ideas that they had maintained for over half a century to full openness. This paper sheds light on the type of ideas most likely to be affected by policy changes that reduce information restrictions. In particular, we can examine whether the collapse of Communism had a stronger effect on more "useful knowledge" (as coined by Mokyr, 2003) for economic development than on "less-useful" knowledge with more cultural content. This setting also allows us to examine whether and how quickly an international convergence in the flow of ideas can be achieved following an institutional change. In particular, we examine how quickly the

[2] An alternative measure of disembodied, non-rival idea flows is patent citations, which track the diffusion of particular technological knowledge across disciplines and geographical space (see, for example, Jaffe, Trajtenberg, and Henderson 1993, Jaffe and Trajtenberg 1999). Book translations are a complementary measure that is driven by a quite different process and captures a different range of types of ideas.

flow of ideas in Communist countries converged to its level in the West, and the extent to which there was persistence in the type of ideas flowing into former Communist countries.

Comparisons of translation patterns in the core Soviet, Baltic and Satellite countries allow us to shed light on the roles of preferences (demand) and repression (supply). While censorship suppressed Western ideas in all three regions, the Soviet and Baltic countries arguably suffered more severe repression as part of the Soviet Union. In addition, the Baltic and Satellite countries had more Western-oriented preferences. Differences in the effect of the collapse between the core Soviet and Baltic countries thus suggest the role of preferences in driving translation flows; differences between the Baltics and the Satellite countries suggest the role of repression.

We use newly-collected data on 789,315 book translations for the period 1980 to 2000. The data were extracted from Unesco's Index Translationum (IT), an international bibliography of the translations published annually in a wide range of countries. We note that we test the effect of Communism's collapse on *translations* of titles rather than on trade in physical books. Translations are a measure of disembodied idea flows, and are thus non-rival, whereas books themselves are rival, as well as likely being driven largely by the same factors as trade in other goods with cultural content. Moreover, the availability of a translation could potentially capture idea flows better than the

number of copies sold.[3] As discussed by Mokyr (2003), an idea flows when it becomes accessible to the individuals who value it and can make use of it, rather than when it becomes known to most people in society.

We compare translation patterns in former Communist countries before and after the collapse using simple OLS regressions. To account for possible general changes in translations over the 1980s and 1990s, we also compare translation patterns in Communist countries with those in Western European countries using a difference-in-differences framework.

We start by showing that when Communism collapsed the overall flow of Western-to-Communist translations increased by a factor of four, which was offset by a two-third decrease in Communist-to-Communist translations. We further document a large increase in Eastern European access to *important* Western ideas measured by translations of the most influential Western titles of the twentieth century. We show that many of these important titles were first translated into any Communist language after the collapse, suggesting the increase in Western-to-Communist translations represented an increase in the availability of Western ideas in any Communist language. In contrast, Communism's collapse did not increase Western demand for Eastern European ideas, which stayed very low after the collapse. These findings are shown to not be driven by changes in the publishing industry that allowed a larger total number of books to be published. We further show that the effect of the

[3] It would nevertheless be interesting to investigate whether copies of translation sold follow similar patterns to translations, but these data are unavailable.

collapse of Communism was largest for translations of titles in fields that were perceived as especially threatening (e.g. religion) and for translations by authors who were perceived as especially threatening. In contrast, translations of titles in exact science, which was strongly supported by Communist governments, increased relatively little from the West when Communism collapsed.

We find that within just a few years total Western-to-Communist translations fully converged to Western levels. This convergence, however, was not uniform. Translations of Western titles in the fields of applied science and social science fully converged to their levels in the West. In contrast, translations of Western titles in the arts did not converge to their levels in the West. This pattern suggests that fields that contain more "useful knowledge" and lend themselves more directly to economic development converged more than fields that contain more cultural information, which illustrate how some cultural differences persisted even after Communism collapsed.[4]

A comparison between translation patterns in Soviet, Baltic, and Satellite countries suggests strong roles for both repression and preferences in determining translation flows. Specifically, before the collapse, Soviet and Baltic countries broadly shared supply-side institutional factors (strong repression), because the Baltic states were under direct Soviet control. However, they differed in that the Baltic states had higher underlying demand

[4] This illustration is consistent with the literature showing how history can shape culture (e.g. Greif 1994, Nunn 2011, Nunn and Wantchekon 2009, and Fletcher and Iyigun 2010).

for Western ideas. We find that Western-to-Baltic translations increased substantially more than Western-to-Soviet translations following the collapse, suggesting preferences for Western ideas played an important role. The relatively small increase in Western-to-Soviet translations is likely the result of the comparatively low Soviet demand for Western ideas and the relatively mild nature of the Soviet reforms.

Moreover, a Baltic-Satellite comparison suggests repression played an important role in shaping translation flows. Baltic and Satellite countries broadly shared demand-side factors, i.e. they shared strong preferences for Western ideas. However, under the direct control of the Soviet regime, Baltic countries suffered from more repression. We find that before the collapse levels of Western-to-Satellite translations were higher than Western-to-Baltic translations, that the effect of the collapse was stronger in Baltic than Satellite countries, and that the gap in Western translations between Baltic and Satellite countries disappeared post collapse. These findings are consistent with repression playing an important role. Importantly, Baltic and Satellite countries not only started to catch up on translation of older titles, but they also converged to Western levels of translations of current titles.

This paper proceeds as follows. In Section 2 we present the data on book translations and explain the construction of our measures of idea flows. Section 3 briefly outlines the historical context of publishing in Communist Europe and of the collapse of Communism. Section 4 describes our empirical strategy for examining the effect of the collapse of Communism on book

translations. Section 5 presents results on the effect of the collapse of Communism on the total flow of translations. Section 6 presents results breaking translations down by book field. Section 7 discusses further the advantages and limitations of translations as a measure of the diffusion of ideas and concludes.

2. Data

The translation data are extracted from Unesco's Index Translationum (IT), an international bibliography of the translations published in a wide range of countries. These data originate at the national level through the law of legal deposit, which specifies that every book published that is intended for circulation must be submitted to the national depository. The national depository then compiles a list of the publications that are translations, and submits this list to Unesco, which standardizes the entries across countries to form the IT.

Titles in the IT are categorized according to the nine main categories of the Universal Decimal Classification (UDC) system: General (0.1% of translations in the period 1980-2000); Philosophy (including Psychology, 5.3%); Religion and Theology (5.7%); Law, Social Sciences, Education (8.5%); Natural and Exact Sciences (4.2%); Applied Sciences (11.4%); Arts, Games, Sports (5.2%); Literature (including books for children, 52.3%)[5];

[5] Literature also includes the very small category Philology and Linguistics.

History, Geography, Biography (including memoirs and autobiographies, 6.6%).[6]

The bibliographic entry for each translation includes information on the country, city, and year in the which the translation was published, the language of the original title and the target language into which it was translated, the field (UDC class) of the title, the number of pages or volumes of the title, the author, and the original and translated titles of the book.[7]

We use data on the translations in Communist countries (our group of interest) and Western European countries (our comparison group) over the period 1980 to 2000, which comprise approximately 800,000 translations. We limit our Communist countries to European countries that were part of the Eastern Bloc and that were Warsaw Pact members in the 1980s, meaning they were under heavy Soviet control pre-collapse because Soviet troops were permitted to be stationed within their borders. Our Communist countries are thus seven former Soviet countries, which we group into the core Soviet countries (Russia, Belarus, Moldova, and the Ukraine), the Baltics (Estonia, Latvia, Lithuania), and six Soviet Satellite countries (Bulgaria, the Czech

[6] For a detailed description of the subfields that make up each UDC field, see https://www.unido.org/library/help/udc.html.

[7] Note in some cases books are translated from a translation rather than from the original. In these cases we use the language the book was originally published in as the original language, and disregard the intermediate language.

Republic, Hungary, Poland, Romania, and Slovakia).[8] The Western European countries in our sample are: Austria, Belgium, Switzerland, Denmark, Spain, Finland, France, Iceland, Italy, the Netherlands, Norway, Portugal, and Sweden. Results are unchanged if we add the USA to the group of Western countries. We include each country only in the years it reported consistently, resulting in an unbalanced panel. Note that Germany is excluded from the analysis because our data do not allow us to distinguish whether a translation published in Berlin (the center of German publishing) after unification was in East or West Germany, and in any case the country post collapse was a single market with a common language. The UK is also excluded because it stopped reporting its translations to Unesco in 1990. However, we do use translations from all Western and Communist languages flowing to our included countries, including translations from English.

Creation of a translation series over time for each country is complicated by the fact that some countries only became independent upon the upheaval of interest in the middle of our period of study. Prior to 1992, the USSR as a whole reported its translations; prior to 1993, Czechoslovakia as a whole reported its translations. Our data provide a rare opportunity to nevertheless allocate the idea flows to the constituent countries. Specifically, we allocate the translations reported by the USSR and Czechoslovakia to one

[8] We omit Yugoslavia because it escaped the Soviet sphere in the Tito-Stalin split of 1948, and Albania because it withdrew from the Warsaw pact in 1968; thus in our period of interest they were no longer politically aligned with the Soviet Union.

of their constituent countries based on the city in which each translation was published.

We note that the translations reported are only those that were submitted to the central depository of the country. In particular, this excludes *samizdat*, the illegal books published under the Communist regime. The exclusion of these titles is unfortunate. The number of *samizdat* translations produced under Communism is not available, but they were likely only a small fraction of total translations. These illegal publications were largely political magazines and bulletins defending human rights and criticizing repression. Although some were poems and books, both locally written by dissidents and translated from foreign publications, the large personal risk involved in owning such books meant their circulation was limited, and the ideas contained therein were not available to the general populace.

3. Historical context

3.1. A brief timeline of the collapse of Communism in Eastern Europe

In the early 1980s, the Soviet Union and its satellites were all Communist countries with centrally planned economies, in which the ruling (and only) party, the Communist Party under some name or other, interfered in virtually all aspects of its citizens' lives. Eastern Europe was isolated from Western Europe by the Iron Curtain, which hindered the movement of both people and information.

The changes that would result in the fall of Communism began in the late 1980s when Gorbachev came to power in the USSR. Among the reforms he instituted, perhaps the most important two were *perestroika*, restructuring of the economy and political system, and *glasnost*, openness in the media and culture. Through these sets of gradual reforms, the Soviet Union began to move in the direction of a market economy, with a decrease in centralization and the emergence of private firms, and the increase in the freedom of people to express their views on a range of topics without fear of retribution.

An important consequence of *glasnost* was that people could now openly air their dissatisfaction with the Communist regime. This freedom spread to the Soviet satellites, and was likely a contributing factor in revolutions that heralded the fall of the Berlin Wall and the collapse of the Communist regimes in the Satellite countries in the last few months of 1989.

The Communist USSR held together for nearly a further two years, though the power of the Soviet Communists was waning and nationalism in the Soviet republics was on the rise. Late in 1991, a conservative coup in Russia aimed at preventing the disintegration of the Soviet Union was staged. Its unintended effect was just the opposite; the USSR was officially dissolved.

The Communist countries had many commonalities, but there was heterogeneity between them in the strength of their Western orientation. The former Soviet countries had a more Russian orientation, the preferences of their consumers favored Western ideas less, and they maintained stronger ties with Russia and demonstrated less effort or desire to integrate with Western Europe.

However, the three Baltic states of the Soviet Union, Latvia, Lithuania and Estonia, were more similar to the Satellites than they were to the Soviet nations. Historically, they were relatively recent additions to the USSR (annexed in 1940), and had always maintained their more Western preferences. They were the first among the Soviet nations to declare their independence from the Soviet Union. Furthermore, their independent streak was highlighted when, upon the collapse of the Soviet Union, they were the only three Soviet states not to join the Commonwealth of Independent States (CIS), the loose alliance of independent countries that succeeded the USSR. Since the disintegration of the USSR, the former Communist countries have coalesced into two trading blocs: the Russia-focused CIS countries in one, and the Western-centered non-CIS countries, including the Baltic states, in the other. For this reason, our main analysis distinguishes the three Baltic states from the other Soviet countries. Moreover, results tell a similar story when we use physical distance from Western Europe as an alternative measure for Western orientation among Communist countries.

3.2. Restricting information flows: publishing and censorship under Communism

Prior to Gorbachev's reforms, book publishing in the Soviet Union[9] was a state-run industry that produced vast numbers of books with little regard

[9] We discuss the publishing and censorship system of the Soviet Union, which is the one best understood by Western scholars and observers during the Communist period. The publishing

for consumer demand.[10] Books seem to have been an important medium for conveying information and ideas.[11] All publishers were owned and operated by the government, and each had its own subject area or field in which it enjoyed a complete monopoly. Book prices, like other prices and wages in the publishing industry, were strictly controlled; each subject had a designated price range, chosen to ensure the subjects the government intended to be widely read were available at low cost. Selection of the titles published was centrally coordinated and crafted according to the government's grand plan.[12]

Central to the organization of the Soviet publishing system was the conception of publishing as an ideological activity. Reading was viewed as a way in which the social consciousness of individuals was shaped, thus full state control over the material published and its availability to citizens was vital. Profits and publishing in order to meet demand were considered less important, though periodically concern surfaced in Soviet publishing circles about the

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industries of the other Communist countries varied in their exact details, but were similar in their principles.

[10] Skelly and Stabnikov (1993).

[11] For instance, Walker (1978) notes, "The idea of the book as a 'direct force in production', which can contribute measurable improvements to the country's economic performance, has been aired by several Soviet writers," and that reading was viewed as an important way in which the "social consciousness" of individuals was molded.

[12] Walker (1978).

shortages of books in specific fields. The process determining the exact titles printed in any year was complex and centrally planned to a high degree.[13]

Censorship of books intended for sale in the USSR was the domain of Glavlit (occasionally referred to by its full name, the "Chief Administration for the Protection of State Secrets in the Press attached to the Council of Ministers of the USSR"). Editors of publishing houses were expected to use their good sense in selecting titles for publication, but the corrected galley-proofs (*granki*) then had to be perused by Glavlit "…both for the mention of prohibited topics and for the observance of political lines and nuances…" (Walker, 1978, page 66) before publication could occur.

[13] USSR-level and republic-level authorities decided on the proportion of total books published in the coming year that would be in each subject area, and assigned printing capacity, paper, and binding materials to individual publishers. Working within these bounds and other specifications given to them, publishers compiled their own lists of planned printings, each item on which then received an approval, rejection, or other recommendation from a "coordinating" central authority. Considerations for the coordinating authority were maintaining the subject monopolies of the printing houses, avoiding duplication of subject matter, and economy in the use of paper, which was often in short supply. Additional centralized planning occurred that was related to the publication of translations (Walker, 1978). Foreign titles were selected for translation by utilizing experts employed for the purpose at home, representatives located in numerous countries abroad, and foreign visiting experts such as scientists. The representatives located abroad reviewed tens of thousands of new books annually. They then bought copies of the most important titles from local bookshops, and mailed them back to their publishers in the USSR (Bernstein et al., 1971).

Censorship of translations followed a somewhat different, but undoubtedly no less rigorous, process, explained by Walker (1978):

> The importance of careful and vigilant selection by Soviet publishers in choosing works for translation from foreign languages has been frequently stressed by Party and government, and is visible in a number of special regulations applying to the publication of translations. A publishing-house considering translation of a foreign work must, unless there is a special need for speedy publication, obtain at least two recommendations for the translation from scholarly institutions or specialists, and secure the agreement of the appropriate chief editorial office in the State Committee for Publishing before submitting details of the work for 'coordination' to the State Committee or (in the case of scientific and technical works) to the State Scientific and Technical Library."

Between 1986 and 1991, control over the publishing industry moved out of state hands. State-owned publishing houses were joined by a multitude of other ownership structures, competition entered the industry, and the focus shifted away from producer-led publishing to consumer-led publishing. The monopoly system of publishers was scrapped; price controls and many state subsidies were terminated. Through the reforms, firms, organizations, and institutions gained the right to publish, and Russian authors and publishers

gained the right to freely buy or sell rights, including in transactions with international parties.[14]

4. Empirical strategy: OLS and difference-in-differences estimates

Communism may have affected idea flows through its effects on the supply of ideas and on the demand for ideas. On the supply side, the political agenda and censorship depressed certain ideas and promoted others. Most notably, the Communist regime depressed ideas centered around the capitalist ideology and promoted pro-communist ideas. On the demand side, Communism may have shaped preferences for ideas (e.g. for Communist ideas) and such preferences may or may not have changed with the collapse of Communism (Alesina and Fuchs-Schündeln, 2007).

Our most basic identification strategy examines the effect of the collapse as a whole, acting through either supply or demand channels. Specifically, we compare translation flows in Communist countries before and after the collapse, where the effect of the collapse depends on both the supply and demand sides. We then consider a number of "counterfactuals" that shed light on the specific roles played by supply and demand factors. First, we compare translation patterns in Soviet, Baltic and Satellite countries. While censorship suppressed Western ideas in all three regions, the Soviet and Baltic countries arguably suffered more severe repression as part of the Soviet Union. In addition, the Baltic and Satellite countries were always more Western in

[14] Skelly and Stabnikov (1993).

their orientation and might have had greater pent-up demand for translations. Differences in the effect of the collapse between the core Soviet and Baltic countries would thus suggest the role of preferences in driving translation flows; differences between the Baltics and the Satellite countries would suggest the role of repression. Second, we compare translation patterns in Eastern relative to Western Europe. The premise here is that there was no censorship post collapse, so that any lack of convergence between East and West post collapse reflected remaining East/West differences in the demand for ideas. Finally, we repeat the comparisons above by type of ideas, such as translations of various book fields with more or less direct economic benefit, and translations of titles that posed more or less threat to the Communist regime.

Because Communist countries may have suppressed information flows from the West and artificially translated more from each other, we distinguish in all our regressions between translations from Western languages and those from Communist languages.[15]

All of our regressions examine the change in translation patterns in former Communist countries post collapse, and take a variation of the following form:

[15] The Communist languages are: Armenian, Azerbaijani, Belarusian, Bulgarian, Czech, Estonian, Georgian, Hungarian, Kazakh, Kirghiz, Latvian, Lithuanian, Moldovan, Polish, Romanian, Russian, Slovakian, Tajik, Turkmen, Ukrainian, and Uzbek. The Western European languages are: Danish, Dutch, English, Finnish, French, Modern Greek, Icelandic, Irish, Italian, Maltese, Norwegian, Portuguese, Spanish, and Swedish. Note the German language is neither classified as a Communist language nor a Western European language.

$$\left\{\begin{array}{l} Y_{ijt} = \beta_{1a} Post_t \times WesternLang_j + \beta_{1b} Post_t \times CommunistLang_j \\ \quad + \beta_{2a} WesternLang_j + \beta_{2b} CommunistLang_j + \beta_3 X_{ijt} + \varepsilon_{ijt} \end{array}\right\} \qquad (1)$$

where Y_{ijt} is the (log) number of book translations in country *i*, in year *t*, from original language type *j* (Western or Communist), $WesternLang_j$ is a dummy for the translations being from a Western European language; $CommunistLang_j$ is a dummy for the translations being from a Communist language, and $Post_t$ is a dummy variable for the years 1991 and onwards.[16] This equation thus allows a basic pre/post collapse comparison for translations from Western and Communist languages. The coefficients on the interactions with $Post_t$ measure the changes in translations from the two language sources post collapse. X_{ijt} is a set of additional controls that includes the logs of population and GDP per capita,[17] and may also include country fixed effects interacted with original language to account for differences across countries that are constant over time.

We also estimate difference-in-differences models that include Western European countries as a comparison group, which accounts for other common

[16] We choose post-1991 because it is midway between the end of Communism in the Satellites (late in 1989) and the collapse of the Soviet Union (late in 1991). Using alternative *Post* variables, namely post-1989, post-1990, and post-1992, does not substantially alter the results (not presented).

[17] Population and GDP data are from Maddison (2003).

factors that may have affected translation patterns over the sample period 1980-2000, and also allows us to directly test persistence in East/West differences. Specifically, we compare the pre- and post-collapse translation flows into Communist countries with flows into Western European countries. The basic difference-in-differences specification is:

$$\left\{\begin{array}{l} Y_{ijt} = \beta_{1a} Communist_i \times Post_t \times WesternLang_j \\ \quad + \beta_{1b} Communist_i \times Post_t \times CommunistLang_j \\ \quad + \beta_{2a} Communist_i \times WesternLang_j \\ \quad + \beta_{2b} Communist_i \times CommunistLang_j \\ \quad + \beta_{3a} Post_t \times WesternLang_j + \beta_{3b} Post_t \times CommunistLang_j \\ \quad + \beta_{4a} Western\ Lang_j + \beta_{4b} CommunistLang_j + \beta_5 X_{ijt} + \varepsilon_{ijt} \end{array}\right\} \quad (2)$$

where $Communist_i$ is a dummy variable for whether the translating country was a former Communist country, and the other variables are as in equation (1). The first coefficient of interest, β_{1a}, measures the effect of the collapse of Communism on Western-to-Communist translations (relative to Western-to-Western translations), and the second, β_{1b}, measures the effect of the collapse of Communism on Communist-to-Communist translations (relative to Communist-to-Western translations). In addition to specifications that control for log population and GDP per capita and include country fixed effects interacted with original language, we also run specifications with year fixed effects interacted with original language to absorb changes over time that are common to all regions.

In both the basic regression and difference-in-differences model, the construction of the dependent variable is complicated by the lack of a one-to-one mapping between countries and languages. We deal with this by only counting translations into the "main" language for each country, defined as the most widely spoken language in the country.[18] In Section 5.5 we show the main results are robust to using the number of pages translated as an alternative dependent variable, and discuss how the results are affected by including translations into secondary languages.

5. The effect of the collapse of Communism on total translations

5.1. Western-to-Communist translations jumped and converged to Western levels, Communist-to-Communist translations declined

Figure 1 shows translations per million inhabitants in the Soviet countries, the Baltics, the Satellites, and the Western European countries. For each set of countries, we show translations from Western European languages and from Communist languages.[19]

This figure shows that before the collapse of Communism, Western European countries had much higher per capita translation rates into their main language than Communist countries, and these translations were almost entirely from Western European languages. The Baltics and Satellites

[18] "Most widely spoken" is defined in terms of native speakers where these data are available, otherwise in terms of the language spoken at home or spoken on a day-to-day basis.

[19] Translations from English show very similar changes over time to translations from all Western European languages.

translated more than the Soviet countries, and all three translated primarily from Communist languages. However, in the few years around 1990, the patterns of translation for Communist countries changed drastically. The Baltics' and Satellites' translations of Western European titles shot up to approach or even exceed the level of translations of Western European countries, and their translations of Communist titles fell away.

By the year 2000, the Satellites' translation patterns had converged to those of Western European countries to a remarkable degree, though they still showed a slight bias towards translations from other former Communist countries. Translations in the Baltics had also moved away from Communist titles and towards Western European ones, though Baltic countries still translated more Communist titles than did Western Europe. The Soviet countries also experienced a fall in translations from Communist languages, but their increase in translations from Western European languages was small and short-lived. These translation patterns stand in contrast to translations from Western European languages in Western European countries, which increased only gradually and by much less over this period.

We next subject these patterns to regression analysis as described in Section 4, which allows us to control better for the relationship between a country's translations, population and GDP.

Column 1 of Table 1 presents the OLS estimation results of regression equation (1), where country fixed effects interacted with dummies for either

Western or Communist original language are included.[20] The results suggest that translations by Communist countries from Western languages increased dramatically, by 480% ($e^{1.761} - 1$). In contrast, translations from fellow Communist countries fell sharply, by 69%. Columns 3-5 present versions of the equivalent difference-in-differences results (equation (2)). Column 3 includes neither country fixed effects nor year fixed effects; column 4 introduces country fixed effects interacted with original language; column 5 also introduces year fixed effects interacted with original language. Because translations tended to increase in Western Europe during the 1990s, the difference-in-difference estimates are generally smaller than the OLS estimates, but they are still economically large and statistically significant. Specifically, in the specification with country fixed effects interacted with original language (column 4), Communist translations from Western European languages rose by 290% relative to Western translations, whereas translations between Communist countries fell by 67%. Column 5 shows these results are robust to including year fixed effects interacted with original language.[21] These large magnitudes demonstrate just how dramatically the titles available in

[20] We do not have comparable population or GDP data for Iceland, thus this country is excluded from these regressions.

[21] We also ran specifications where we allowed separate linear time trends for each original language in each country (results not presented). The main results hold up, though significance is reduced. Note however that this specification may in fact underestimate the effect of the collapse of Communism on translations because some of the changes that constituted the collapse of Communism are likely falsely attributed to the time trends.

Eastern Europe shifted from Eastern to Western European when Communism collapsed.

In contrast, column 4 of Table 1 also shows that Western countries did not translate more Communist titles post collapse; the coefficient on the interaction of $Post_t$ with $CommunistLang_j$ is small (-0.084) and statistically insignificant. That is, translations from Communist languages in Western Europe, which were few, showed little change over the period. The lack of change is as we would expect, given translation flows in this direction were not restricted prior to the collapse.

We next examine how the differences in level of repression pre-collapse and degree of Western orientation between Soviet, Baltic, and Satellite countries reveal themselves in their translation patterns.[22] Specifically, to our

[22] As an alternative measure for Western orientation among Communist countries, we use physical distance from Western Europe. Results (presented in Appendix Table B.1) tell a similar story: Western-to-Communist translations increased post collapse more in former Communist countries located closer to Western Europe; and former Communist countries close to Western Europe converged to Western levels of translations of Western titles, whereas more distant Communist countries did not. These findings are consistent with the idea that countries with more Western preferences, as proxied by distance to Western Europe, converged more to Western translation levels than countries with less Western preferences. Alternatively, in Appendix Tables B.2 and B.3, we replace distance from Western Europe with the quality of the legal and political systems or with the strength of intellectual property rights protection. These institutional measures have little correlation with translations post collapse. As a further alternative, we divide the Communist countries by whether they are Slavic or non-Slavic, and by whether they are primarily Catholic or Orthodox. Translations in the Slavic countries show

previous OLS specification we add interactions between all variables and dummies for the translating country being a Baltic or being a Satellite, and in our difference-in-differences specification we allow all *Communist* effects and interactions to differ for Baltic, Satellite and other Communist (Soviet) countries.

Column 2 of Table 1 present the results from the OLS specification, and columns 6-8 present results from the difference-in-differences specification with various additional controls. In every specification, the increase in translations from Western European languages was largest for the Baltics, intermediate for the Satellites, and positive but insignificant for the Soviets; the decrease in translations from Communist languages was insignificantly larger for the Baltics, and insignificantly smaller for the Satellites than for the Soviet countries. Satellite translations of Western titles increased by 290% in the difference-in-differences specification with population and GDP controls and country fixed effects interacted with original language, compared with 760% for Baltic translations, and 54% for Soviet translations. In contrast, translations

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similar patterns to those in the Soviet nations, and translations in the non-Slavic countries are similar to in the Satellites and Baltics. However, the Slavic/non-Slavic difference is less pronounced than the Soviet/Baltic/Satellite differences. Similarly, the Orthodox countries behave more like the Soviet nations and the Catholic countries more like the Baltics and Satellites, though the distinction here is smaller again. The Slavic countries are Russia, the Ukraine, Belarus, the Czech Republic, Slovakia, Poland, and Bulgaria. The Catholic countries are Lithuania, Poland, the Czech Republic, Slovakia, and Hungary.

of Communist titles decreased by 61% for Satellites, 78% for Baltic countries, and 74% for Soviet countries.

To address the critique of Bertrand, Duflo and Mullainathan (2004), we follow their recommended procedure and aggregate our data to one pre-collapse and one post-collapse observation.[23] [24] Appendix Table B.10 shows the equivalent difference-in-differences regressions to Table 1, but run with only these two observations for each country/original language pair. The main findings largely remain unchanged.

Because the collapse of Communism was a huge event associated with many different changes to aspects of society and the economy, adjustment (in the translation industry and elsewhere) may have taken some time. We thus now examine the time path of changes in translations that followed the collapse of Communism. We run a version of column 6 of Table 1 that replaces *Post* and its interactions with year dummies (for each year 1981 and onwards) and their equivalent interactions.[25] This analysis also allows us to examine more

[23] They show that difference-in-differences techniques applied to data with more than two periods generate inconsistent standard errors because they do not account for serial correlation of the outcomes.

[24] The pre-collapse values of the variables are the averages for the years 1980 to 1989, and the post-collapse values are the averages for 1992 to 2000. We discard data from 1990 and 1991, considering this the transition period.

[25] We do not expect to see significant changes prior to 1989, and indeed the coefficients on the interactions are small and insignificant for both types of original languages and all three sets of translating countries every year pre 1989.

precisely how similar Eastern and Western Europe become. Figure 2 plots the coefficients of interest. Strikingly, it shows that most of the effects of the collapse occurred within a few years, after which point translations largely stabilized at their new levels. Panel A shows that the positive effect of the collapse of Communism on translations from Western Europe begins in 1989 and becomes significant in 1991 for the Satellite countries, but appears only in 1992 for the Soviets and Baltics, consistent with the later date of the collapse of Communism in the USSR. By about 1992 the increase stabilizes, especially for the Baltic and Satellite countries. Panel B shows that the negative effect of the collapse on translations between Communist countries increases until 1991, at which time it largely stabilizes.[26] [27] [28]

As suggested by Figure 1,[29] these regression results show that, within a few years of the collapse, translations of Western titles in Baltic and Satellite

[26] Appendix Figure A.1 shows a similar graph where we also include country fixed effects interacted with original language in the regression equation (equivalent to column 7 of Table 1). The effects are similar and generally more precisely estimated, but there it is not possible to compare Communist translations with the Western level of translations.

[27] We present this figure for the difference-in-differences specification, but the equivalent graph for the OLS specification looks nearly identical.

[28] This figure also shows Communist-to-Baltic translations were particularly low in 1991. We are unable to determine whether this is a genuine phenomenon caused by the collapse of Communism, or whether the data on translations this year are just incomplete.

[29] Note Figure 1 understates the convergence of Communist translations of Western titles to Western translation levels because it doesn't control for incomes, which were lower on average in the Communist countries.

countries converged to and even surpassed such translations in Western countries, but in Soviet countries did not. Likewise, Panel B of Figure 2 shows that translations of Communist titles fell over several years in all three Communist regions (though coefficients are not significant for every year), but remained higher than their level in the West.

The relatively small increase in Western-to-Soviet translations is likely the result of both demand-side and supply-side factors. On the demand side, Soviet preferences favored Western ideas less than did Baltic and Satellite preferences.[30] On the supply side, the reforms in the Soviet countries tended to be less comprehensive than the reforms in the Baltic and Satellite countries.[31] Appendix Figure A.3 shows that the average strength of democracy in the Soviets never increased to the degree it did in the Baltics and Satellites, and in fact partially reverted in the mid-1990s. In Appendix D we describe these democracy data and investigate more fully how the degree of reform in a country was related to its change in translations. In Appendix Tables B.2 and

[30] Suggestive evidence of this can be seen in the support individuals had for a free market economy post collapse. Central and Eastern Eurobarometer surveys conducted between 1991 and 1997 in many of the Soviet, Baltic, and Satellite countries asked whether the respondent felt a free market economy was right or wrong for his or her country. Comparisons between average responses in the three regions, presented in Appendix Figure A.2, show support for a free market economy was substantially higher in the Baltics and Satellites (and in fact similar in these regions) than in the Soviet countries.

[31] However, degree of reform was arguably endogenous to preferences, so this supply-side factor could ultimately stem from the demand side.

B.3 we explore whether differences between Communist countries in the quality of the legal and political systems or in the strength of intellectual property rights protection post collapse can explain the differences in convergence to Western Europe. We find these institutional measures are at most weakly correlated with translation flows post collapse, though they were strongly correlated pre collapse. This may suggest the limited importance of such institutional factors in the small increase in Western-to-Soviet translations.

In Section 5.5 we discuss the robustness of these findings to including translations into the secondary languages of the countries.

5.2. Convergence in translation flows or catching up on stocks?

The convergence of Communist to Western countries that we observe could reflect a convergence in the rate of translation of new titles (flows), which might suggest a genuine convergence in access to new Western ideas. Alternatively, it could reflect a catching up on older titles missed out on during the Communist era (stocks), which might suggest the apparent convergence is only a temporary phenomenon and does not imply similar access to new Western ideas in Communist and Western Europe. We now examine this issue.

Table 2 shows our difference-in-differences regressions separately for translations from Western languages for flows, which we define as titles

translated within 15 years of their publication, and stocks, or older titles.[32] [33] Both translations of stocks and flows of Western titles show large increases and convergence to Western levels in Communist Europe upon the collapse of Communism. This suggests both a convergence in access to new Western ideas, and a catching up on older ideas.

5.3. The collapse of Communism increased Communist access to important Western titles

The ideas in some books are more important than the ideas in others. We now investigate how the collapse of Communism affected Communist translations of Western titles that are considered particularly influential. In this analysis, we track when and where specific titles were translated, and are thus able to show that the increase in Communist translations of Western titles represented an increase in the availability of Western titles in any Communist

[32] Our main data set does not contain the years in which the original titles were published. However, for a sample of over 1,400 translations from Western languages, we identified the original dates of publication from online sources, and used these to calculate the percentage of titles translated in Western and Communist countries pre and post that were stocks or flows. Across fields, the median percentage of translations that were flows in Communist Europe was 58% in the pre period and 71% post; in Western Europe it was 78% in the pre period and 82% post. The results presented here use the total number of translations, adjusted within each field using the appropriate flow percentages.

[33] Our findings are robust to using other cutoffs such as 10, 20, or 30 years (results not presented).

language, not just the translation into additional Communist languages of titles that had previously been translated into, for instance, Russian.

We compile a list of titles that are considered particularly important in Western Europe and the US. The titles are from the Central and East European Publishing Project's (CEEPP) list of the 100 books that have been most influential in the West since 1945, the Modern Library's list of the 100 best non-fiction books of the 20th century published in English, and National Review's best 100 non-fiction books of the 20th century (see Appendix C for further details). Similarly, we compile lists of influential authors and the titles most translated in Western Europe.

The first two columns of Table 3 show translations of influential titles before and after the collapse of Communism.[34] It shows that most of these titles were not translated anywhere in Communist Europe in the pre-collapse period. Specifically, only 30 of the 178 influential titles were translated into any language in a Communist country pre-collapse, compared with the 116 that were translated in Western European countries. After the collapse, 80 of these titles were translated in Communist Europe. When we restrict attention in the next two columns to those titles written by anti-Communist authors, this effect is even more pronounced: only 4 of the 30 titles were translated pre collapse in

[34] Note we require a balanced panel of countries for the pre/post comparisons between different regions to be meaningful. Because some countries are missing data in some years, we limit the years included in Table 3 to 1980-1996, and the countries to those with data in each of these years. In Appendix Tables B.5 and B.6, we present the results from two alternative samples of countries with different sets of years. The patterns are similar.

Communist Europe (compared with 19 in Western Europe), and this increased to 20 post collapse. Translations of the most translated titles and influential authors show similar increases.

Importantly, this table demonstrates that the inflow of Western translations published in the smaller Communist languages post collapse represented a flow of new knowledge from Western into Communist Europe, and did not merely duplicate titles that had previously been translated into Russian.

To control for other factors that affected translation of these titles over time, we run difference-in-difference regressions at the title level, predicting the number of Communist or Western countries that translated the title pre or post collapse (details in Appendix C.[35] Results are presented in Appendix Table B.7 columns 1 to 3 present results for the influential titles, columns 4 to 6 for the most translated titles, and columns 7 to 9 for the influential authors. The table shows that the average number of Communist countries translating each influential title increased by about 70% post collapse (relative to Western countries), suggesting the collapse indeed increased Communist access to important Western ideas. Furthermore, we show that influential titles written by Nobel laureates, those written by anti-Communist authors, and those first published during the Communist period were both translated less pre collapse

[35] Specifically, we regress the log of 1 plus the number of Communist or Western countries translating the title on a dummy for Communist countries and its interaction with post-1989, and title fixed effects interacted with post.

in Communist Europe and increased more post collapse. These patterns suggest such titles were more threatening to the Communist regime, and faced higher latent demand.

5.4. The collapse of Communism did not affect total publications of books

One possibility is that the increases in Western translations post collapse were driven by changes in the publishing industry that allowed a larger total number of books to be published. If this were the case, then the increase in translations could be mechanical rather than indicating an increased openness to Western ideas.

Table 4 presents OLS before/after and difference-in-differences specifications with the total number of books published, including both translations and original titles, as the dependent variable.[36] The table shows that the total number of books published in Communist countries did not increase with the collapse of Communism, and may have actually declined. Specifically, the coefficient of interest, which is the coefficient on *Post* in the

[36] Book publication data are from the Unesco Statistical Yearbooks for the years 1985-99 and from Unesco's online data on book production available at http://stats.uis.unesco.org/unesco/. They are available pre and post collapse for only a subset of our countries, namely the Communist countries Belarus, Bulgaria, Estonia, Hungary, Latvia, Poland, Romania and the Ukraine, and the Western European countries Belgium, Denmark, Finland, France, Iceland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, and Switzerland. Note, however, that these data are only available at an aggregate level and a large number of years are missing, which precludes using them to conduct more complex analysis.

OLS specifications and on *Post*Communism* in the difference-in-differences specifications, is negative and small in most specifications.

5.5. Further robustness checks and alternative specifications

Accounting for translations into countries' secondary languages

The vast majority of the population in many countries speaks natively and uses for everyday interactions the same single language. However, some countries have several widely spoken languages, and native languages may differ from the language of education or commerce. As a robustness check, here we also include translations into secondary languages.[37] We include as secondary languages all additional languages that are (de facto) official in part or all of the country, or that are natively spoken by at least 5% of the population. Note specifically that this includes Russian in many of the Communist countries.

Appendix Table B.4 presents the results from these regressions. The main difference between these results and the results from our central specification is that here the difference in the extent to which the Satellite and Soviet countries increase their Western translations decreases in magnitude and loses significance. However, the results remain that Satellite countries pre collapse have significantly higher translations of Western titles than Soviet and

[37] We prefer not to include translations into secondary languages in our central specification because any cutoff for which secondary languages should be counted for a particular country is necessarily arbitrary, and by including multiple target languages in a country we double- (or triple-) count titles that are translated into more than one of these languages.

Baltic countries, but the Baltic countries experience a significantly ($p<0.01$) larger increase in these translations than either the Soviets or the Satellites, and as a result both Baltic and Satellite translations of Western titles converge to Western levels, while Soviet translations do not.[38]

Number of pages translated as an alternative dependent variable

For robustness, we use the number of pages translated as an alternative dependent variable that captures the possibility that longer books contain more ideas. Because we are concerned that some of the short publications might not in fact be books, we limit translations to titles of 49 pages or longer (the

[38] In addition, despite the high level of isolation from Western Europe pre collapse, some individuals in Communist Europe, particularly among the more educated, were able to read Western European languages such as English or French. These individuals faced less than the full increase in access to Western original titles suggested by the increase in translations, because they had the potential to read Western originals pre collapse if these were available in their countries. However, it is likely that most such individuals still faced lower costs of reading Western titles in translation (post collapse) than in the original, so an increase in translations of Western titles into their languages did represent some increase in access to Western ideas. Appendix Table B.8 presents data from 1995 on ability to speak English or French; knowledge of both languages was considerably higher in the Baltic and Satellite countries than in the Soviet countries. This suggests a higher proportion of people in the Soviet countries were "fully treated" by the increase in Western translations post collapse. On the other hand, learning a Western European language is an alternative way to translations to access Western European ideas, and as such indicates Western preferences. Thus it is unsurprising that the countries that increase Western translations more, suggesting an eagerness to embrace Western ideas, also show a higher aptitude in these languages.

minimum length for a "book" as defined by Unesco). Appendix Table B.9 shows that the results are similar when using this alternative dependent variable.

Comparing Communist countries that transitioned to different degrees

We showed that the effect of the collapse of Communism was stronger in the Western-oriented Satellites and Baltics, both of whose translations of Western titles converged to Western levels. More generally, we expect the countries that transitioned more into democratic market economies to have experienced greater convergence to the West. We show in Appendix Table B.11 that Communist countries that transitioned more away from Communism increased more their translations of Western European titles into their main language (the data and empirical strategy used in this analysis are described in Appendix D). However, this finding doesn't hold when including translations into secondary languages. We note that a main disadvantage of using variation in the degree of transition is that unlike the event of Communism collapsing, these reforms were outcomes likely deriving from many of the same factors as translations.

Accounting for Russian-speaking populations in other Communist countries

Our main analysis shows Soviet countries lag behind Baltic, Satellite and Western countries in their translations of Western titles post collapse. To create a lower bound on these differences, we include translations into Russian

in each of the Soviet countries in addition to translations into the country's main language. The results, presented in Appendix Table B.12, are very similar to the specifications that include translations into secondary languages, discussed above and shown in Appendix Table B.4.[39]

A related consideration is that, given the populations of the Soviet countries have a relatively high knowledge of Russian, titles translated into Russian in Russia may have circulated in these countries as well. We deal with this consideration in two ways. First, we aggregate the Soviet nations up to a single Soviet bloc, and plot in Appendix Figure A.4 how translations per capita in this Soviet bloc were affected by the collapse of Communism.[40] [41] We include translations into Russian and the main languages of the other Soviet countries that were published in any of these countries.[42] In fact, because of the much larger Russian population and publishing industry, the effect here is very similar to the effect on Russian translations in Russia alone. As in our main specification, we see the increase in Western translations in the Soviet

[39] We note that the Satellite countries translate very few titles into Russian; including translations into Russian as well as into the main language for all the Communist countries instead of just the Soviet countries makes no difference (results not presented).

[40] The countries included are Russia, Belarus and Moldova. We omit the Ukraine because of missing data.

[41] We do not duplicate our main regressions using this aggregation, because it only leaves us with one Soviet observation for each original language and year.

[42] This approach double counts titles that were translated into multiple Soviet languages. Alternatively, we include only titles that were translated into Russian in a Soviet country; results (not presented) are very similar.

countries was smaller and less lasting than the increase in the Baltic and Satellite countries, though in this case Soviet translations of Western titles do settle substantially above their pre-collapse level.

Second, in Section 5.3 we study when and where specific titles were translated and show that, even supposing all Communist countries had access to all titles translated in any Communist country, the collapse of Communism was still associated with a large increase in access to important Western titles.

Accounting for the possibility of Russia translating for other Communist countries

A potential concern is that many translations into Communist languages might actually be published in Russia, the largest of the Communist countries and the political center of Communist Europe, rather than in the home country, in which case we would under-report the ideas flowing into the other Communist countries. That is, the concern is that translations from, for instance, English into Czech are published in Russia. To account for this possibility, we ran specifications including Russia's translations into other Communist languages as translations in the appropriate Communist countries. In fact, the number of such translations was very low and the results (not presented) are effectively unchanged.

6. The effect of the collapse by book field

We next investigate how the effect of the collapse of Communism on book translations varied by the type of ideas contained in the books. We examine whether the collapse of Communism had a stronger effect on knowledge that is more directly economically useful. We also examine whether the effect was bigger for titles in more ideological fields, which were likely to be more threatening, and smaller for titles in more objective fields.[43]

We investigate the effects of the collapse on each of the eight book fields Exact Science, Applied Science, Social Science, Arts, Literature, Philosophy, Religion, and History using difference-in-difference regressions. Further, we use keywords in the book titles to disaggregate each of the eight fields into subfields such as mathematics, physics and chemistry, and test the effect of the collapse of Communism on each subfield. Appendix Figure A.5 shows how translations in each aggregate field changed over time.

Figure 3 presents graphically the results from difference-in-differences regressions predicting log translations plus 1, which we run separately by field.[44] [45] The figure shows considerable heterogeneity in the effect of the

[43] Note we do not have quantitative measures of the economic usefulness, ideological content, or objectivity of the various fields, so our comparisons along these dimensions are qualitative only and somewhat subjective.

[44] The independent variables are as in equation (2), plus the logs of population and GDP per capita.

[45] For each field we also run two separate regressions, a probit regression predicting whether the number of translations is positive (extensive margin), and an OLS regression that estimates

collapse across fields.[46] Communist translations of Applied Science and Social Science, two fields likely to be particularly economically useful and important for economic growth, converged especially strongly to Western translations. In contrast, translations of Western titles in the more culture-specific fields of History and especially Arts showed less convergence to Western levels, which likely reflect consumer preferences that differ considerably between the two halves of Europe.[47]

We further disaggregate the fields by using keywords in the titles to categorize them into subfields such as mathematics, physics and chemistry.[48]

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the log number of translations given the number of translations is non-zero (intensive margin). Appendix Table B.13 presents the coefficients on the interactions of interest in both regressions. The results tell a similar story.

[46] When we look separately by field at Soviet, Baltic, and Satellite countries, we see similar differences between fields, though the overall levels of translations differ as shown in our main analysis.

[47] However, translations in Literature did show strong convergence. Literature differs from the other fields in that the average age of titles translated is considerably older. There is also a relatively thick tail of very old literature titles translated, suggesting that classics of literature remain relevant, whereas classics in other fields are more likely to become outdated. The convergence of literature may thus be driven largely by catching up on decades of missed classics.

[48] We break down into subfields titles in Exact Science, Social Science, Applied Science and Religion only; titles in the other fields are not named informatively enough to allow categorization by keywords in their titles.

The details of the procedure are given in Appendix E.[49] Within each broad field we run a difference-in-differences regression that compares the effects across constituent subfields.[50] The coefficients of interest are the interactions of the subfield fixed effects with the *Post*Communist* variable. The coefficients of interest and their confidence intervals are shown in Figure 4 which suggests that within the field of Exact Science the more objective fields (e.g. mathematics) seem to jump less than the less objective fields (e.g. biology); in Social Science economics jumped the most, in Applied Science, medical titles, and in Religion, Christian titles.

We note that the broad fields that were affected most and least by the collapse, Religion and Natural Science, are both interesting cases. Religious titles were translated relatively little in Communist Europe pre collapse and saw large increases in translation post collapse, consistent with religion being severely restricted in most Communist countries.[51] At the other end of the spectrum, the more objective field of Exact Science was relatively heavily translated in Communist Europe pre collapse, and was thus less affected by the collapse. This is consistent with research in Exact Science being encouraged by

[49] In order to consistently categorize books by keywords in their titles, we focus on titles translated from English.

[50] Specifically, we regress the log of translations + 1 on the full interactions between a set of sub-field dummies and a basic difference-in-differences specification, and control for log population, log GDP per capita, and a set of country fixed effects.

[51] Riasanovsky and Steinberg (2005).

the Communist regime, probably because it was unthreatening to Communism and was vital for Soviet power on the world stage.

7. Conclusions and discussion

Idea flows have received limited empirical attention because they are inherently difficult to measure. We tackle this empirical challenge by introducing book translations as a measure of non-rival, disembodied international idea flows. We use this measure to study how the flow of ideas transmitted by translations was affected by the collapse of Communism in Eastern Europe, which is an attractive setting to study how policy and institutional changes affect idea flows.

As reflected in book translations, we find a strong substitution of the Baltic nations and Satellite countries away from Communist ideas and towards Western ideas: the collapse of Communism resulted in a fourfold increase in translations of Western European titles in the Satellite countries, and nearly an ninefold increase in the Baltic countries, suggesting a huge increase in the inflow of Western ideas, and a decrease of over 60% in translations of Communist titles in both these regions, suggesting a decline in the flow of ideas between Communist countries.

Furthermore, we find evidence of rapid and strong idea convergence of Baltic and Satellite countries to Western Europe. Our findings are consistent with both catching up on the stock of ideas that were missed out on under Communism and a convergence between the Baltic and Satellite countries and

Western Europe in access to new Western ideas. In contrast, Western-to-Soviet translations did not converge to Western levels, suggesting the diffusion of Western ideas into these countries was limited.

The degree of convergence to Western levels of translations varied substantially across types of Western ideas. Whereas Communist countries' translations of Western titles in the more scientific fields, which likely contain knowledge that is more useful for economic development, reached their levels in Western Europe post collapse, translations in Arts, a more cultural field, did not converge.

This study of the Communist regime and its collapse in Eastern Europe is not only a natural context for the study of international idea flows, but it also contributes to our understanding of this highly important episode in history. First, this is the first study to empirically assess how Communism affected idea flows.[52] Second, while it is known that Communist Europe had low inflows of Western knowledge and ideas (e.g. Garton Ash, 1995, Harrison, 2003, 2005), the emphasis is typically on the stronger censorship of Western ideas in Eastern Europe. Our empirical strategy sheds light on the roles of both repression and preferences for ideas in determining translation flows. We conclude from the

[52] There is a literature that documents and explains the transition of Eastern European countries from Communism into market economies (e.g. Blanchard 1994, 1996, 1997, Aghion and Blanchard 1994, Frye and Mansfield 2003), and the transition away from socialism of Israeli kibbutzim (e.g. Abramitzky 2008, 2011). Alesina and Fuchs-Schuendeln (2007) studies the effect of the collapse of Communism on preferences). However, this paper is the first to test the effect of the collapse of Communism on the flow of information and ideas.

greater increase in Western-to-Baltic translations than Western-to-Soviet translations that preferences for Western ideas played an important role in translation flows. From the lower initial level of Western-to-Baltic translations relative to Western-to-Satellite translations, and the convergence of both to Western-to-Western translations, we conclude repression played an important role in shaping translation flows.

More broadly, our paper sheds light how economic incentives shape the international diffusion of knowledge, which economic historians view as one of the most crucial economic phenomena of all (see various work by Joel Mokyr). One wider lesson from our paper is that when these incentives are seriously impaired by institutions, this can have severe effects that are only remedied as institutional change occurs.

Naturally, book translations have a number of limitations as a measure of the flow of ideas. They only allow us to measure idea flows across language barriers, which precludes measuring idea flows between countries that share a language, or between linguistically similar groups within a country. Furthermore, because of the length of time it takes to write a book, they tend not to capture very new ideas. In addition, some people are able to read multiple languages, so have access to ideas before they are translated.[53] Finally,

[53] However, it is reasonable to assume that such a person finds it less costly to read in his own language, thus an increase in translations into his native language implies a reduced cost of access to information.

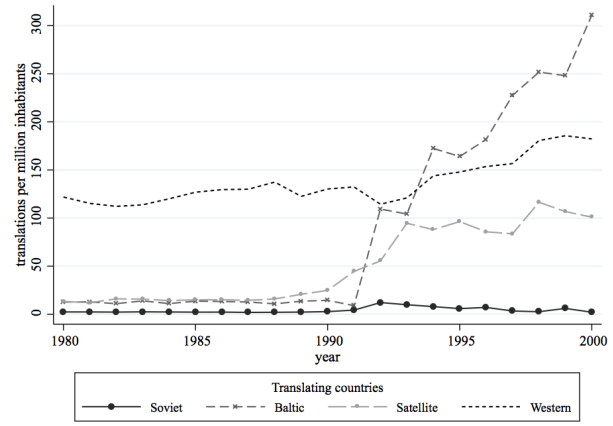
ideas in books must by definition be codifiable as opposed to tacit. That is, they must be able to be expressed in words and written down.

Despite these limitations, translations are an attractive measure of the international flow of ideas because they capture flows of non-rival, disembodied ideas, and their key purpose is to transmit written ideas, information and/or knowledge between languages. Moreover, they are both quantifiable and classifiable by field and specific content, and thus lend themselves naturally to empirical work.

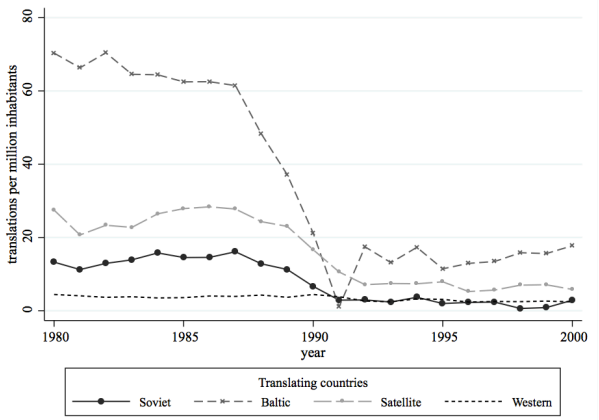
Figure 1: Translations in Communist and Western Europe

Panel A: Linear scale

Western original languages

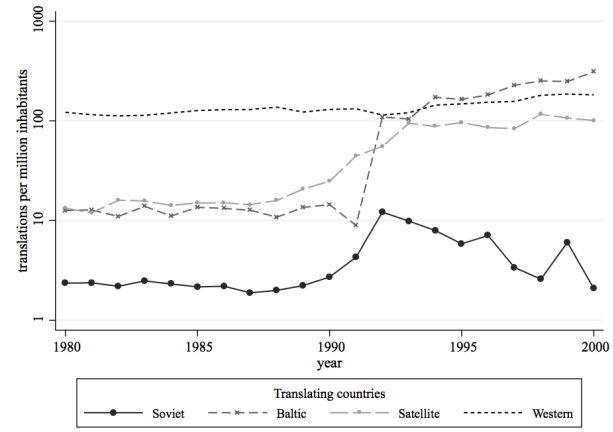


Communist original languages

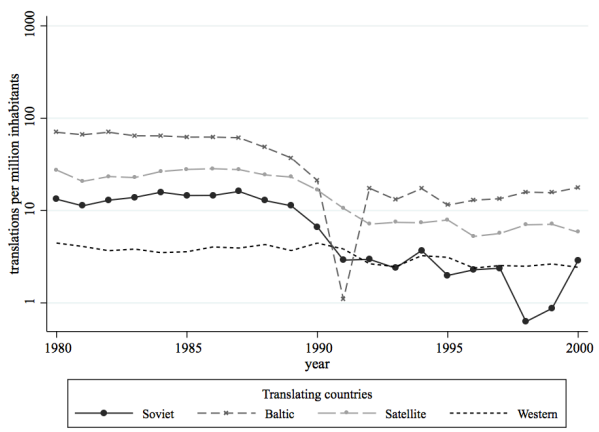


Panel B: Log scale

Western original languages



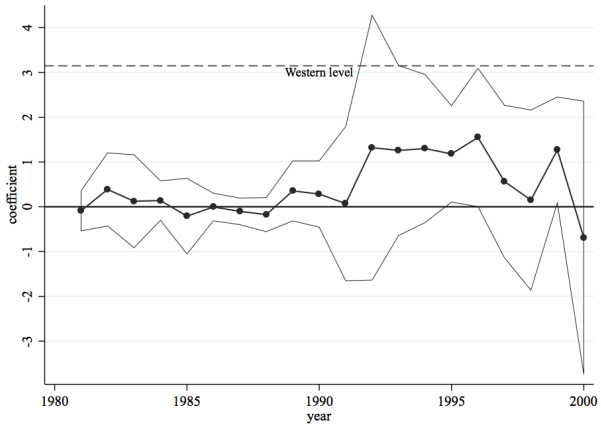
Communist original languages



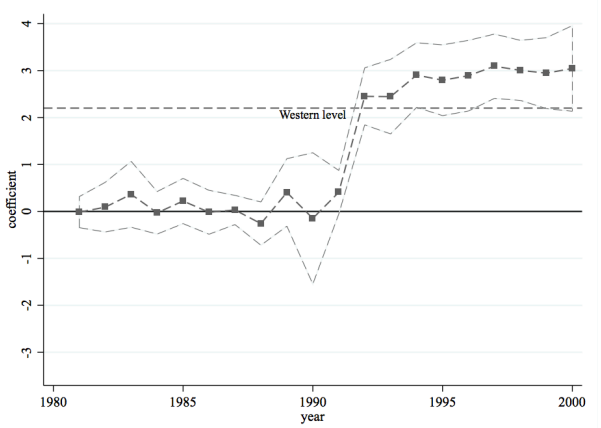
This figure shows translations from Western European and Communist languages in the former Soviet countries (excluding the Baltics), the Baltic countries, the Satellite countries, and Western European countries. The values are averages over the countries in the regions.

Figure 2: The effects over time of the collapse of Communism on translations
Panel A: Translations from Western European languages published in:

Soviet countries



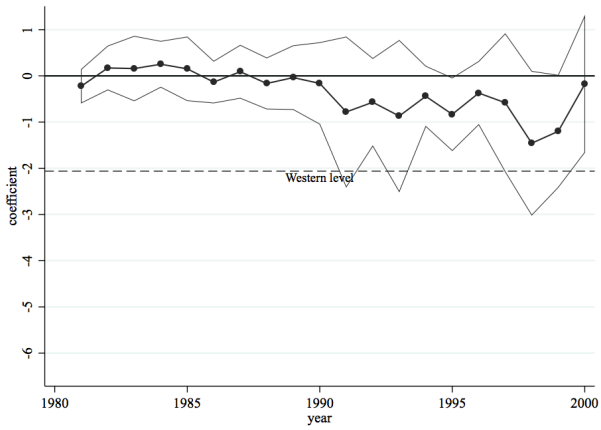
Baltic countries



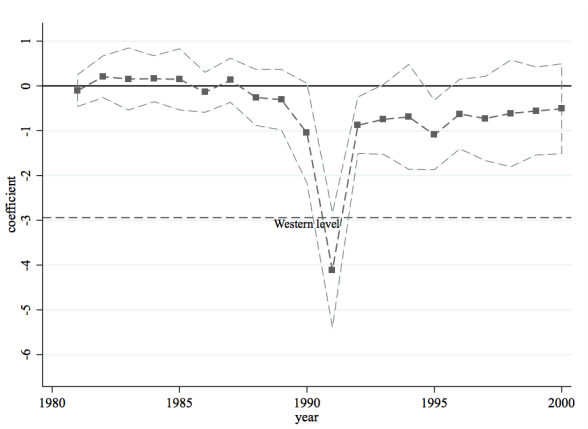
Satellite countries

Panel B: Translations from Communist languages published in:

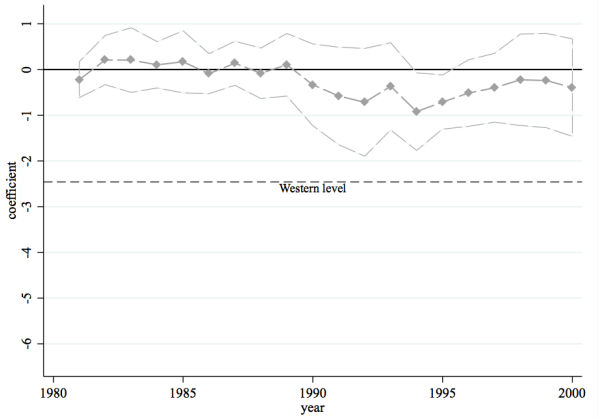
Soviet countries



Baltic countries

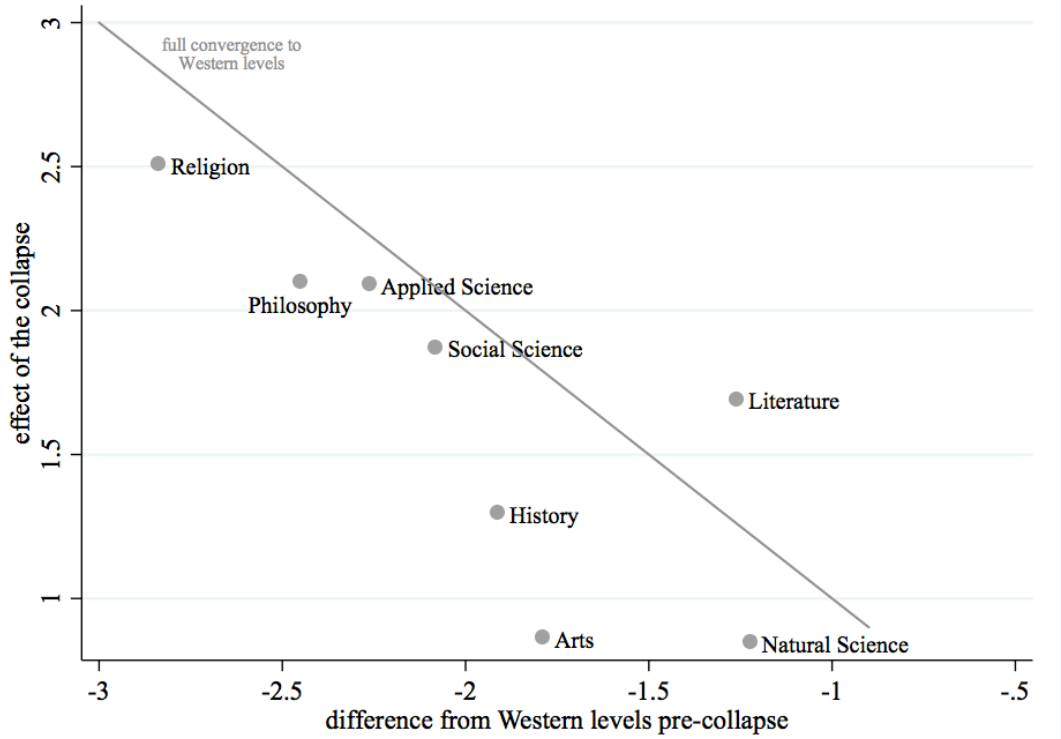


Satellite countries

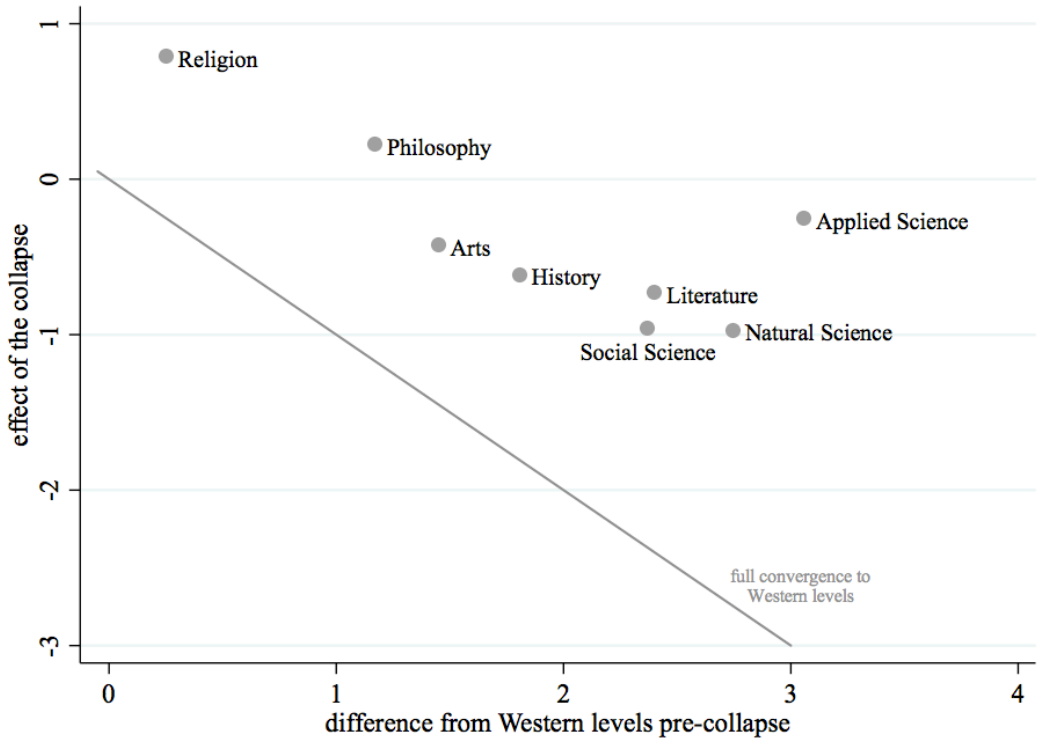


The coefficients plotted are from the estimation of a version of equation (2) where effects in Communist countries are allowed to differ for Soviet, Baltic, and Satellite countries. The post dummy and its interactions have been replaced by year dummies (for 1981-2000) and their equivalent interactions. Controls for population and GDP per capita are also included. The figure shows coefficients and 95% confidence intervals on interactions of the year dummies with Western (Panel A) or Communist (Panel B) translations in Soviet countries (excluding Baltics), Baltic countries, and Satellite countries. The Western level line is the negative of the coefficient on Soviet, Baltic, or Satellite interacted with Western (Panel A) or Communist (Panel B) original language.

Figure 3: The effect of the collapse of Communism on translations by field
Panel A: Western-to-Communist translations

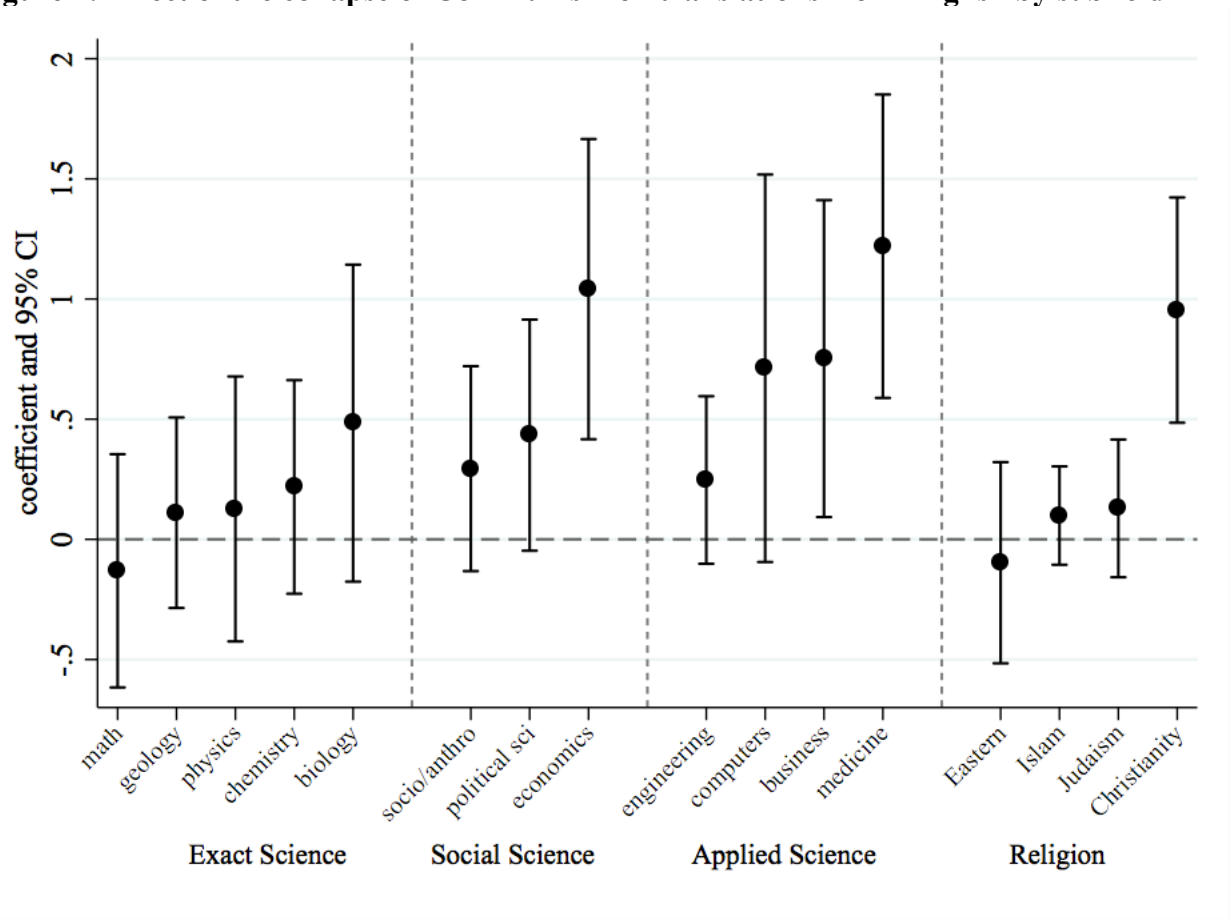


Panel B: Communist-to-Communist translations



This figure plots the coefficients from difference-in-differences regressions predicting log translations plus 1 run separately by subject as described in Section 6. In each panel, the x-axis plots the coefficient on the interaction between Western (Panel A) or Communist (Panel B) original language and Communist translating country. The y-axes plot the coefficients between the interactions between these variables and a post-1991 dummy.

Figure 4: Effect of the collapse of Communism on translations from English by subfield



The regressions that give rise to these coefficients are difference-in-differences regressions comparing Communist with Western Europe, run by field as described in Section 6.

Table 1: Before/after and difference-in-differences analysis: The effect of the collapse of Communism on book translations

Dependent variable: log number of translations in a country, year and for an original language type (Western or Communist)

Coefficients of interest are fully interacted with Western original language (top panel) or Communist original language (lower panel)

	OLS: pre vs post		**Difference-in-differences: Communist vs West**					
Sample:	Communist countries only		Communist and Western European countries					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Translations from Western original languages in:								
Communist country (Soviet, Baltic, or Satellite) * post	1.761***	0.823**	1.897***	1.361***	1.428***	0.730	0.432	0.535
	(0.179)	(0.329)	(0.269)	(0.233)	(0.256)	(0.511)	(0.360)	(0.412)
Baltic country * post		1.701***				1.995***	1.714***	1.636***
		(0.331)				(0.342)	(0.318)	(0.325)
Satellite country * post		0.919**				0.979**	0.937***	0.907**
		(0.330)				(0.402)	(0.318)	(0.342)
Communist country (Soviet, Baltic, or Satellite)			-1.739***			-3.169***		
			(0.498)			(0.933)		
Baltic country						0.977		
						(0.748)		
Satellite country						2.123***		
						(0.660)		
Post			0.043	0.380**		0.097	0.369**	
			(0.135)	(0.153)		(0.146)	(0.154)	
Translations from Communist original languages in:								
Communist country (Soviet, Baltic, or Satellite) * post	-1.160***	-1.405***	-0.582***	-1.095***	-1.009***	-0.837*	-1.332**	-1.224**
	(0.186)	(0.449)	(0.206)	(0.267)	(0.292)	(0.465)	(0.490)	(0.515)
Baltic country * post		-0.188				-0.117	-0.175	-0.169
		(0.451)				(0.320)	(0.442)	(0.422)
Satellite country * post		0.374				0.274	0.392	0.351
		(0.514)				(0.374)	(0.496)	(0.505)
Communist country (Soviet, Baltic, or Satellite)			2.583***			1.987***		
			(0.424)			(0.509)		
Baltic country						0.807		
						(0.558)		
Satellite country						0.402		
						(0.519)		
Post			-0.437**	-0.084		-0.383**	-0.095	
			(0.160)	(0.174)		(0.170)	(0.173)	
Other controls:								
Western/Communist original language dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Population and GDP controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects * Western/Communist original language	Yes	Yes		Yes	Yes		Yes	Yes
Year fixed effects * Western/Communist original language					Yes			Yes
R-Squared	0.869	0.888	0.673	0.921	0.928	0.774	0.928	0.935
Observations	511	511	964	964	964	964	964	964

An observation is a country, year, original language (Western or Communist)

Notes: Each column is a regression predicting the log number of translations published in the country, year, and from the original language (Communist or Western European). Columns 1 and 2 are OLS regressions using annual data for the period 1980-2000, run for countries in Communist Europe (versions of equation (1) as described in Section 4). Columns 3-8 are difference-in-differences OLS regressions, with Communist Europe as the region of interest and Western Europe as the comparison group (versions of equation (2) as described in Section 4).

Three types of Communist countries are distinguished in this analysis: the Soviet countries (Russia, Belarus, Moldova, the Ukraine), the Baltics (Estonia, Latvia, Lithuania), and the Satellite countries (Bulgaria, the Czech Republic, Hungary, Poland, Romania, and Slovakia). The Western European countries used are Austria, Belgium, Switzerland, Denmark, Spain, Finland, France, Italy, the Netherlands, Norway, Portugal, and Sweden. The Communist and Western original languages are given in footnote 15. *Post* is a dummy for 1991 onwards. *Population and GDP controls* are the logs of population and of real GDP per capita. Standard errors, in parentheses, are clustered at the country level. * p<0.10, ** p<0.05, *** p<0.01.

Table 2: Access to new Western ideas: The effect of the collapse of Communism on translations of recent versus older Western titles

Dependent variable: log number of translations from a Western original language

	Recent titles (15 years old and newer)				Older titles (more than 15 years old)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post * Communist country	1.417***	2.114***	1.485***	1.408***	1.263***	1.960***	1.331***	1.254***
	(0.283)	(0.352)	(0.305)	(0.325)	(0.283)	(0.352)	(0.305)	(0.325)
Communist country	-2.966***	-1.997***			-2.029***	-1.061*		
	(0.484)	(0.597)			(0.484)	(0.597)		
Post	0.428***	0.119	0.530***		-0.027	-0.335*	0.076	
	(0.125)	(0.178)	(0.173)		(0.125)	(0.178)	(0.173)	
Population and GDP controls		Yes	Yes	Yes		Yes	Yes	Yes
Country fixed effects			Yes	Yes			Yes	Yes
Year fixed effects				Yes				Yes
R-Squared	0.478	0.610	0.934	0.943	0.269	0.453	0.908	0.920
Observations	500	482	482	482	500	482	482	482
An observation is a country, year								

Notes: Each column is a difference-in-differences regression predicting the log number of translations of recent titles (columns 1-4) or of older titles (columns 5-8) from Western languages published in the country and year. Communist Europe is the region of interest and Western Europe is the comparison group. Data are annual for the period 1980-2000 (see Section 5.2 for data construction). See the notes to Table 1 for the Communist and Western countries used (note Iceland is also included in columns 1 and 5) and the Western original languages. *Post* is a dummy for 1991 onwards. *Population and GDP controls* are the logs of population and of real GDP per capita. Standard errors, in parentheses, are clustered at the country level. * p<0.10, ** p<0.05, *** p<0.01.

Table 3: Number of important titles and authors translated pre and post-collapse by country and region, 1980-1996

Translations of:	Influential titles		Anti-Communist influential titles		Most translated titles		Influential authors	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Panel A: Translations into country's main language								
Belarus	0	1	0	1	2	5	1	5
Russia	8	27	0	8	38	70	34	74
Soviet countries	**8**	**27**	**0**	**8**	**38**	**71**	**34**	**75**
Estonia	3	12	1	5	8	24	10	30
Baltic countries	**3**	**12**	**1**	**5**	**8**	**24**	**10**	**30**
Bulgaria	10	30	0	10	32	67	34	71
Czech Republic	2	24	0	9	23	42	23	68
Poland	16	53	3	15	52	94	58	97
Romania	5	17	1	7	23	44	31	51
Slovakia	2	7	0	2	23	29	15	31
Satellite countries	**29**	**72**	**4**	**20**	**71**	**134**	**89**	**122**
Communist countries	**36**	**79**	**4**	**20**	**79**	**146**	**94**	**131**
Austria	12	2	5	1	37	25	30	20
Belguim	8	0	2	0	43	13	29	9
Denmark	24	21	8	3	111	84	58	55
Spain	89	68	18	15	203	176	136	135
France	57	31	9	9	116	80	118	133
Norway	7	20	4	2	63	66	41	54
Western European countries	**116**	**90**	**19**	**19**	**227**	**205**	**162**	**171**
Panel B: Translations into any language								
Belarus	0	1	0	1	16	15	4	13
Russia	8	27	0	8	38	71	34	75
Soviet countries	**8**	**27**	**0**	**8**	**38**	**72**	**35**	**75**
Estonia	3	13	1	6	8	24	10	30
Baltic countries	**3**	**13**	**1**	**6**	**8**	**24**	**10**	**30**
Bulgaria	10	30	0	10	32	67	34	71
Czech Republic	2	24	0	9	23	42	23	68
Poland	16	53	3	15	52	94	58	97
Romania	6	18	1	8	31	45	32	51
Slovakia	3	8	0	2	27	31	19	36
Satellite countries	**30**	**73**	**4**	**20**	**72**	**135**	**89**	**122**
Communist countries	**37**	**80**	**4**	**20**	**80**	**148**	**94**	**131**
Austria	12	2	5	1	38	25	31	21
Belguim	8	0	2	0	52	20	29	14
Denmark	24	23	8	3	111	85	58	55
Spain	92	69	18	15	204	183	136	138
France	58	32	10	9	118	82	118	134
Norway	7	20	4	2	63	68	41	55
Western European countries	**118**	**91**	**19**	**19**	**228**	**215**	**162**	**172**
Total possible	**178**		**30**		**240**		**213**	

This table shows for a balanced panel of countries and years the number of titles of each type (influential, influential by an anti-Communist author, or most translated) or the number of authors translated pre (1980-1988) or post-collapse (1989-1996). Translations are also tabulated for the Soviet, Baltic, and Satellite regions as a whole, and for Communist and Western Europe. Panel A counts translations into the main language of the country only, whereas Panel B counts translations into any language published in the country. The countries included are those that provided data for each year 1980-1996.

Table 4: Size of the publishing industry: The effect of the collapse of Communism on total book publications

Dependent variable: log total number of books published

	Pre vs post			Difference-in-differences			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Post * Communist country				-0.378*	-0.052	-0.084	-0.111
				(0.218)	(0.149)	(0.122)	(0.113)
Post	-0.230	0.136	0.123	0.148	0.172*	0.216**	
	(0.163)	(0.092)	(0.110)	(0.152)	(0.097)	(0.082)	
Real GDP per capita (ln)		0.729**	0.463		0.547**	0.472*	0.423*
		(0.287)	(0.267)		(0.230)	(0.234)	(0.207)
Population (ln)		0.555***	-1.955		0.572***	-0.897	-0.675
		(0.121)	(1.521)		(0.080)	(1.232)	(1.267)
Communist country dummy				Yes	Yes		
Country fixed effects			Yes			Yes	Yes
Year fixed effects							Yes
R-Squared	0.037	0.580	0.884	0.234	0.788	0.948	0.958
Observations	131	131	131	339	327	327	327
An observation is a country, year							

Notes: Each column is a regression predicting the log total number of books published in the country and year. All columns use annual data for the period 1980-2000 (where available). Columns 1-3 are before/after OLS regressions using only the Communist countries; columns 4-7 are difference-in-differences OLS regressions where the region of interest is Communist countries and the comparison group is Western Europe. The Communist countries used are Belarus, Bulgaria, Estonia, Hungary, Latvia, Poland, Romania and the Ukraine, and the Western European countries used are Belgium, Denmark, Finland, France, Iceland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, and Switzerland. *Post* is a dummy for 1991 onwards. Standard errors, in parentheses, are clustered at the country level. * p<0.10, ** p<0.05, *** p<0.01.

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