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The Diffusion Pattern of Enterprise 2.0 Technologies: Worldwide Estimates of a Bass Co-diffusion Model for the Last 10 Years

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Abstract: This paper studies the dynamics of industry and country adoption of Enterprise 2.0 technologies such as social networks, wikis or video sharing tools through the estimation of a generalized Bass diffusion model. We find significant rank and epidemic effects for the set of technologies studied. In general, firm adoption rate has peaked and total diffusion has reached saturation in developed countries. The next wave of impact is to go from adoption to extensive use of those technologies within enterprise. Finally, we find that imitations effects are lower in enterprise than in consumer use, and that there are large co-diffusion effect, anchored by the diffusion of enterprise social networks.

Keywords: Enterprise 2.0; Diffusion model; Social networks; Blogs; Wikis

JEL Classifications: O32, M15, M3, L2, D24

1. Introduction

While Web–based collaboration technologies such as social networks, blogs, wikis, or video sharing tools have been adopted massively by internet consumers, the same family of collaboration technologies has been spreading, but with less force, in the sphere of corporations, under the label of Enterprise 2.0 (McAfee, 2009, or Bughin, 2009). Recently, the hope for a pervasive diffusion of Enterprise 2.0 has resurfaced. Among providers, Facebook had announced to launch an enterprise version of its social network while major software companies such as Microsoft went on a spree to acquire native social software companies (e.g. Yammer) to be integrated in their enterprise software suite.

The potential of social technologies to improve the economics of firm is not new. Those technologies have been argued to facilitate better flow of information, and consequently improve many corporate functional capabilities, e.g. marketing through social media and marketing co-creation; operations via better supply chain coordination; or still R&D, via more effective collaborative product design and developments (Alberghini *et al*. 2013 or Bernoff, 2012).

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Bughin (2010) reports productivity improvement from the 2/3 of firms in his sample which had adopted at least one enterprise 2.0 technology such as blogs, social networks or wikis. He estimated a productivity gain of up to 3% for companies adopting enterprise 2.0 for their workflows, versus non adopters. This productivity effect is found mostly in areas of marketing and R&D, and for companies building explicit ecosystems with their suppliers and customers, through the use of digital enterprise 2.0 technologies. The magnitude of the productivity effect is in fact, remarkably large. The effect is as high as the effect on computers adoption on US companies productivity in the 1990's (Brynjolfsson, 2003), especially given that barely one out of 3 employees is using any social technology for her day-to-day job.

Those findings call for a better understanding as to the mechanisms of inter (and intra) firm diffusion of enterprise 2.0. To the best of our knowledge, this has never been studied formally and remains an open issue. This article attempts to fill this gap, using parsimonious to more generalized models of inter-firm adoption, and delivers three main findings:

1) First, using a co-diffusion Bass model, epidemic effects are found to be relatively important in the inter-firm diffusion of enterprise 2.0. The ratio of contagion to innovation is in the range of what is found in aggregate models of Bass adoption of technologies for both consumers and commercial use. Second, we find strong co-diffusion effect, with in general, corporate social networks serving as the core anchor technology of the the co-diffusion pattern found within the entire family of enterprise 2.0 technologies.

2) Second, the Bass model is a parsimonious, yet restrictive model of diffusion. Leveraging the economic literature of technology adoption that states that the contagion effect will depend on multiple economic effects (Zettelmeyer and Stoneman, 1993), we further endogenize the parameters of the Bass model, and find that the mechanics of diffusion depend in decreasing order, on the intra-diffusion of internet access among employees, on profit impact of adopting enterprise 2.0, as well as on the capacity of companies to leverage enterprise 2.0 outside their boundaries with customers (and less so with) suppliers.

3) The findings above generally hold true for every enterprise 2.0 technology analyzed, and whether we cut the data by industry or by country. One difference is that the estimated ceiling to adoption for prediction markets and podcasts remains low,-- less than 50%. This suggests some enterprise 2.0 technologies are being perceived as more niche than others; in contrast, enterprise social networks, or Wikis have much higher adoption ceiling, of about 80% for the 20 countries selected.

All in all, the findings confirm that adoption of enterprise technology is a highly dynamic process, and that economic/ factors play a role in patterns of diffusion. While this is no exception for enterprise 2.0, with peak adoption less than 10 years as for other internet technologies, some new effects are clearly highlighted in this study, including the role of co-diffusion of enterprise social networks, or the joint importance of intra-diffusion of internet access in the workplace.

After a quick background review in Section 2, the model is presented along with results in Sections 3 and 4. Finally, Section 5 concludes.

2. Background and Hypotheses

2.1 Internet diffusion patterns

There is already a vast literature regarding adoption and diffusion patterns of web-based technologies. In general, the emerging picture is one in which a) diffusion patterns are driven by a mix of innovation and contagion effects, b) diffusion depends on a few important economic and product features , c) consumer adoption seems faster than enterprise adoption.

Regarding *consumer adoption* of internet access, household adoption is closely linked to quality of internet access and consumer revenue elasticity (Chinn, M. D., & Fairlie, R. W. 2007). Further, the pattern of internet access adoption typically follows a S-curve; using a Bass model of diffusion, Turk and Turkman (2012) demonstrate that internet diffusion exhibits large imitation effects, with comparable shape to telecom and media durable goods such as mobile telephony, cable or satellite TV services. The typical inflexion point at which diffusion start to accelerate for internet access is just above 7 years for developed countries, with peak diffusion about 5 years later. Internet broadband diffusion takes however 2-3 times longer for developing countries to take off and peak (Dewan *et al*. 2010).

Regarding *consumer's* internet applications adoption, web based applications spread faster than access, (as access is a pre-requisite for the former). Further, most social applications, exhibit large imitation effects and fast peak of diffusion. Wong *et al*. (2011) concludes that internet communications applications reach an inflexion point below 5 years. Franses (2015) found that most consumers social networks adoption rates peak between 2-4 years. There is also large difference in imitation by brands, e.g., imitation effect is large for Snapchat and Instagram, but low for Badoo and YouTube. Likewise, most sustainable social networks exhibit strong innovation effects, e.g. Instagram versus What's App (for social communication), or YouTube versus Vimeo (for video- sharing applications).

Regarding *company adoption* of internet technology, the pattern seems to be one of slower pace of adoption than for consumer adoption. Daim and Suntharasaj (2009) used a Bass model of adoption to assess the diffusion of RFID technology in retail-- they found that it would take at least seven or eight years for the retailers to adopt at pace internet of things technology at their point-of-sale (POS). More aggregate models at industry level, such as Forman *et al*. (2005), demonstrate a large industry mix effect on the local use of commercial internet technologies; Zhu *et al*. (2006) found that country regulatory framework, and country size are important factors of business diffusion of the internet.

Furthermore, a large economic literature, inspired by seminal work by Karshenas and Stoneman (1993), emphasizes the important of economic and competitive factors to explain the inter-firm diffusion of technologies, through *variable* imitation effects. Besides typical epidemic factors such as learning, Karshenas and Stoneman (1993) highlight the importance of e.g. stock effect (e.g. profitability of early mover decreases with higher adoption), order effect (e.g., persistent effect of early mover, such better brands), or even rank effect (the fact that some companies have persistent profit advantage and thus generate ex post large returns to adoption). Hollenstein and Woerter (2008) identify important rank, stock order, on top of epidemic effects as influence on inter-firm diffusion of internet technologies.

Finally, there is rather a narrow set of analyses focusing on enterprise 2.0; at the micro-level, Bughin (2010) reports that the distribution of adoption of a set of Enterprise 2.0 technologies exhibits a strong power law. Only a few companies widely adopted those technologies, for a long tail of businesses remaining at stage of minimal experimentation. Bughin (2010) went on to test drivers of inter-firm adoption variance, concluding that there are large "scope" effects in adoption (in the sense that the probability of adopting one application is closely related to others being adopted), while most profitable firms tend to adopt earlier. The study however has not considered the imitation effect.

2.2 Hypotheses for testing

From the above, we may want to test that, as for other internet technologies, both intrinsic and external factors should influence the pattern of adoption of enterprise 2.0. In particular, we postulate the following three hypotheses as illustrated in Figure 1:

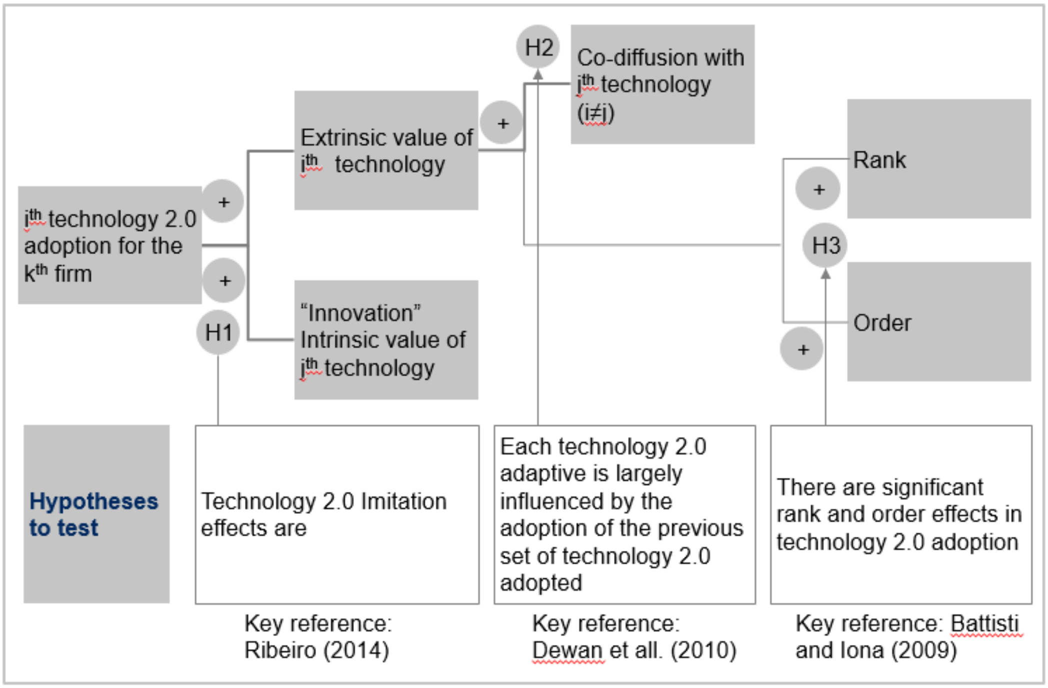

Figure 1. Conceptual model for enterprise 2.0 diffusion

H1: *Enterprise 2.0 diffusion reflects a mix effect of innovation and imitation effects*.

H1 is a direct consequence of the empirical findings on technology diffusion; in particular, we are interested in the relative ratio of imitation to innovation, that is, the average proportion of new adopters which have met some previous time adopters (endogenous factor of influence), to new adopters (exogenous factor of influence).

In general, this ratio has been found in the range of 15 for consumer durable goods (Sultan, *et al*. 1990), but can be larger for high-tech goods, and/or services with major social media influence. For typical high-tech consumer products, ratios lie in the range of 25 to 1 (Wong *et al*., 2011). For web-based social media products, Ribeiro (2014) finds a ratio above 50 for the membership development of global social media platforms such as the HuffingtonPost, Netflix or Linked'In. Fransens (2015) confirms the results for Linked'In while large viral effects are especially strong for Instagram, Snapshat, Netlog or Tumblr.

We still expect some large epidemic effects for enterprise 2.0, as driven by work normalization practices. For instance, Haller and Siedschlag (2011) found imitation effects in the range of 30% for company propensity to develop an online ordering channel, and as large as 70% for establishing a web site.

H2: *Enterprise 2.0 imitation effects are dependent on economic factors.*

H2 is the result of the micro-foundations of the theory of technology adoption by firms in a competitive environment. In general, there is a stronger evidence for rank effects than for stock and order effects.

H3: *They are significant co-diffusion effects among various technologies of Enterprise 2.0*.

Enterprise 2.0 includes a large set of technologies. Our analysis covers the main ones, that is corporate social networking, corporate wikis, blogs, podcasts, prediction markets and video sharing platforms. Consistent with the theory of complementarity in technology family adoption (Battisti and Iona, 2009 or Dewan *et al*., 2010), we believe that adoption of one specific enterprise 2.0 application will depend on others being adopted as part of one family of social applications.

3. Construction of the Model

3.1 The generalized model

We use a generalized Bass model of co-diffusion to estimate the dynamics of innovation and imitation in diffusion for enterprise 2.0.

Let us then define M_{ik} as the maximum number of companies adopting the *i*th social technology in the *k*-th country (or the *k*-th industry). Let us also define $P_{ik,t}/M_{ik}$, as the proportion of companies which have adopted the *i*-th social technology at time *t* in the country/industry *k*. We note G_{ikt} as the growth of adopters between time *t* and *t*+1. The typical Bass model writes:

$$G_{ikt} = \left(p_{ik} + q_{ik} \cdot \frac{S_{ikt}}{M_{ik}}\right) \cdot (M_i - P_{ikt}) \qquad (1)$$

If companies tend to adopt social technologies jointly, we extend the Bass model with a co-diffusion effect, that is:

$$G_{ikt} = [\left(p_{ik} + q_{ik} \cdot \frac{S_{ikt}}{M_{ik}}\right) + q_{ik,j} \cdot S_{jt-x} \cdot \frac{S_{ikt}}{M_{ik}} \ ] \cdot (M_i - P_{ikt}) \qquad (2)$$

for any *j* being any other technology different from *i*.

Furthermore, *q* may not be constant, but depends on various economic effects. We posit that *q* can be approximated by a function of a vector *Z*' (to be detailed later), q_{ik}=$q(Z')_{ik}$, and the more general model becomes :

$$G_{ikt} = [\left(p_{ik} + q(Z')_{ik} \cdot \frac{S_{ikt}}{M_{ik}}\right) + q_{ik,j} \cdot S_{jt-x} \cdot \frac{S_{ikt}}{M_{ik}} \ ] \cdot (M_i - P_{ikt}) \qquad (3)$$

where $q(Z) > 0$ demonstrates epidemic effects (H1); $p > 0$ implies more global adoption effect than epidemic alone, $q_{kj} > 0$ implies co-diffusion between enterprise 2.0 technologies *k* and *j* (H3), while the set of derivatives $\partial q/\partial Z'$, if significant, are consistent with H2.

3.2 Data

To estimate equation (3) above, we rely on a series of surveys performed by McKinsey &Company, since 2006 until 2014 included, or 9 years of time series, on a panel of 11,000 companies. This sample has been used in a set of other research, see eg Bughin and Chui (2011). Other articles leveraging the panel for enterprise 2.0 are Bughin and Manyika (2007; 2008), and Bughin (2010).

The panel is private and owned by TNS, a major global market research firm. The typical survey is completed by C-suite companies, with TNS guaranteeing that respondents have been trained to fill the complete questionnaire. There is also an incentive to answer adequately as outliers are removed, and only non-outliers receive comparison of insights among peers as a confidential file for their own use**.** Data originate from more than 60 countries. We reduce our focus to 20 countries, for which we have *at least* 50 company data points each year. The list includes: the US, Germany, UK, Italy, Spain, France, the Netherlands, Poland, Russia, Mexico, Brazil, Argentina, South Afrika, Nigeria, India, China, Indonesia, Japan, Australia and Malaysia.

We also do a zoom by sectors, and imposing at least 50 companies for an industry to be included in our dataset, leads us to consider 8 clusters of industries: service companies, finance, manufacturing, retail, telecom and high-tech, healthcare and pharma as well as public administration. Data were then aggregated by TNS at country, and industry level, and sample provided.

Table 1. Percentage of firms which have adopted the social technology

Enterprise 2.0 technology	2006	2014
Blogs	17%	67%
Prediction markets	5%	23%
Podcasts	22%	39%
Video-sharing	22%	54%
Social networking	12%	66%
Wikis	25%	43%

For background, aggregate statistics on the adoption pace of social technologies by companies are provided in both Tables 1 and 2.

Table 1 shows that the largest diffusion is found in corporate blogs and social networks. Regarding the latter, the annual diffusion rate per year is about 6% of firms, or more than double the one for podcast, corporate wikis and prediction markets. This diffusion speed is consistent with other data (Arazy and Croitoru, 2010, or Gaspoz , 2011).

Table 2 provides the cut by country, split between developed countries (US + Europe + Japan/Australia), and all other aspiring countries. There is quite some variance by country and by sectors, with coefficient variations (CV) typically in the range of 20-40% depending on social technology type, and years. Not surprisingly, developed countries have led the charge in enterprise 2.0 adoption with developing countries lagging. High-tech and business services have the largest adoption rate among sectors (Bughin, 2010).

Table 2. Adoption rates by country

Enterprise 2.0 technology	Adoption rate, 2014		CV, 2007-2014
	Aspiring Countries	Developed Countries	
Blogs	47%	74%	26%
Prediction markets	22%	28%	33%
Podcasts	27%	46%	35%
Video-sharing	47%	64%	33%
Social networking	47%	73%	23%
Wikis	23%	54%	27%

Note: CV= variation coefficient

We also build the vector Z', as Z'(INT, PROFIT, CUST, SUPPL). The average sample values of those variables are described in Table 3.

Table 3. Economic variables affecting imitation rate of enterprise 2.0

Variables	Average	CV by Countries	CV by Industry
INT	65%	13%	17%
PROFIT	1.4%	45%	55%
CUST	36%	37%	39%
SUPPL	23%	41%	48%

Notes: (1) CV = variation coefficient average across 2007-2014
(2) PROFIT, CUST, SUPPL vary by technology; weighted average is presented here.

The first variable, INT, is the portion of employees in industry/country with access to internet for work practices. The portion INT is relatively large, in about 69% of employee and we expect that $\partial q/\partial \mathrm{INT}>0$, i.e., companies are faster to adopt, the broader base of their employees who benefit from internet access. This is consistent with results in Battisti and Iona (2009).

The second variable, PROFIT, measures the reported profit impact of using enterprise 2.0 technologies by industry/country. PROFIT value averages about 1.4% of total profit, and we expect $\partial q/\partial \mathrm{PROFIT}>0$, i.e., more companies are willing to invest if observed returns are large. Again this is consistent with theory (Karshenas and Stoneman, 1993).

The last two variables, measure respectively the portion of customers (CUST) suppliers (SUPPL) connected by enterprise 2.0; roughly 1/3 of customers, and 1/4 of suppliers, are connected by any of enterprise 2.0 technology and we also expect $\partial q/\partial \mathrm{SUPPL}>0$ and $\partial q/\partial \mathrm{CUST}>0$, i.e., the more externally connected companies are, the more the incentive to adopt (see Bughin, 2008).

4. Results

We posit the following linear function:

$$q = q_0 + q_1 \cdot INT + q_2 \cdot PROFIT + q_3 \cdot SUPP + q_4 \cdot CUST + v \quad (4)$$

leading to the following econometric model (5):

$$\frac{G_{ikt}}{M_i - P_{ikt}} = p_{ik} + q_{0ik}\frac{S_{ikt}}{M_{ik}} + q_{1ik}\left(INT \cdot \frac{S_{ikt}}{M_{ik}}\right) + q_{2ik}\left(PROFIT_k \cdot \frac{S_{ikt}}{M_{ik}}\right) + q_{3ik}\left(SUPP_k \frac{S_{ikt}}{M_{ik}}\right) + q_{4ik}\left(CUST_k \frac{S_{ikt}}{M_{ik}}\right) + q_{ikj} \cdot \left(S_{jt-x} \cdot \frac{S_{ikt}}{M_{ik}}\right) + v' \quad (5)$$

where *v*' is a disturbance term and equation (5) is estimated by Nonlinear Least Squares, with heteroscedastic-consistent estimates.

The general equation (5) can be reduced to (2) or (1) by imposing restrictions to the estimation. An F-test of (q_1, q_2, q_3, q_4) being jointly significant calls for a generalization of the Bass- model as per economic theory. A t-test for significance of $p > 0$ would lead to the acceptance of a Bass-like model, versus a more restricted form of epidemic model. A t-test for significance of q_{ijk} can be applied to assess the existence of co-diffusion elements.

As we are looking at dynamics of co-diffusion (term ($S_{jt-x.}S_{ikt}/M_{ik}$)), we have also experimented with different value of time lags, but in practice, we could only choose for $x = 0, 1, 2$ for the maximum lag given time-series restriction of sample. We found that $x = 1$ maximizes the fit of equation for each technology estimation in (5). We also include fixed effects to control for either different country or sector dynamics, depending on panel cut. We also picked one technology, *j*, as the anchor measure of co-diffusion. Here, we select the technology with has both a siginifcant co-diffusion effect, and with the largest improvement in the fit of the equation (5). We look at the highest delta R^2, for selecting the anchor technology.

We also have reweighted the country data by GDP, using IMF references statistics, as well as the sector data using mulitple industry data as sources, (e.g. The Banker for financial services, ITU for telecom, etc.). Hence, given equation (5) and dummy effects, we have 27 parameters to estimate, and 15 for industries, for a sample size, N=160 for countries, and N= 64 for industries. Note that results are convergent whether we cut the data by industry or by country.

Tables 4 and 5 present the general estimate results. Table 4 presents the results of q=q(Z) in equation (4). Table 5 exhibits the complete results for equation (5), at the estimate of q*=q(Z*'), with Z* the average value of all economic variables, as reported in Table 3. This facilitates a more "like-to-like" comparison with other estimate of Bass models of inter-firm technology diffusion.

Table 4. Economic drivers estimates of enterprise 2.0 imitation rate

Panel a) (cross-country)	**Imitation parameters (cross-country)**					**Joint significance of F-test**
	q_0	q_1	q_2	q_3	q_4	
Blogs	0.074	0.063	1.17	0.079	**0.016**	1.02%
Prediction markets	0.042	0.045	1.24	0.071	0.113	0.28%
Podcast	0.129	0.042	2.04	0.102	0.092	0.32%
Video-sharing	0.089	0.060	**0.98**	0.086	**0.022**	1.43%
Social networks	0.311	0.149	3.72	0.267	**-0.012**	0.86%
Wikis	0.055	0.117	0.99	0.075	**0.043**	0.37%

Panel b) (cross- industry)	**Imitation parameters (cross- industry)**					**Joint significance of F-test**
	q_0	q_1	q_2	q_3	q_4	
Blogs	0.088	0.062	1.140	0.080	0.021	0.21%
Prediction markets	0.072	0.040	1.020	0.039	0.110	0.07%
Podcast	0.118	0.041	1.860	0.125	**0.034**	1.42%
Video-sharing	0.066	0.055	1.000	0.071	**0.023**	1.06%
Social networks	0.279	0.136	2.430	0.155	**0.000**	0.27%
Wikis	0.054	0.079	**1.080**	0.100	**-0.007**	2.32%

Note: Value of parameters **in bold** indicates non statistically significant parameter at 5% (one way test).

4.1 Economic drivers of imitation

Check Table 4 first. The economic determinants of imitation tend to be positive and are roughly convergent whether we look from inter-country or inter-industry perspective. There is thus clearly a case to support hypothesis H2, with about 75% of coefficients being statistically significant. The importance of economic factors is confirmed by an F-test on the global joint significance of (q_1,q_2,q_3, and q_4). The F-test value is uniformly lower than the value at 5% risk level, for each enterprise 2.0 technology and whether the estimation is done on cross sections of countries or industries.

To further facilitate comparison, we also have computed the beta-coefficients (elasticity at the sample mean) for all economic variables. We find that all elasticities are less than one, and are worth 25% for INT, 16% for CUST, 9% for PROFIT and 4% for SUPP across all enterprise 2.0 technologies. Thus, the major effect on imitation propensity is linked to the capacity of employees to access internet in the workplace. The second most important effect is the capacity of companies to extend the use of enterprise 2.0 to their customers.

Finally, we find that the economic dimensions explains roughly 50% of the value of q*, and thus are relatively important. Their effects are clearly large if one looks for example at enterprise social networks, see Table 4.

Table 5. Extended Bass Co-diffusion model for enterprise 2.0

Panel a) (cross-country)	**p_i**	**q_i**	**q_j**	**j =**	**Implied ceiling**	**Adjusted R^2**
Blogs	0.025	0.162	0.035	Social networking	71%	82%
Prediction markets	0.009	0.142	0.068	Social networking	33%	91%
Podcast	0.022	0.245	0.062	Video-sharing	44%	76%
Video-sharing	0.011	0.161	0.071	Podcasts	61%	78%
Social networking	-0.011	0.562	-	-	82%	74%
Wikis	0.009	0.176	0.061	Social networking	47%	82%

Panel b) (cross- industry)	**p_i**	**q_i**	**q_j**	**j =**	**Implied ceiling**	**Adjusted R^2**
Blogs	0.024	0.181	0.034	Social networking	74%	80%
Prediction markets	0.009	0.153	0.066	Social networking	35%	90%
Podcast	0.021	0.217	0.035	Video-sharing	42%	56%
Video-sharing	0.011	0.143	0.083	Podcasts	60%	69%
Social networking	0.002	0.462	-	-	88%	81%
Wikis	0.010	0.145	0.052	Social networking	52%	81%

Notes: 1. Fixed effects included;

2. q_i is computed at the average of economic variables;

3. All variables are statistically significant at 5% (one way test)

4.2 The generalized diffusion of enterprise 2.0

Using now q=q*, Table 5 presents the equivalent of the extended Bass-model. We do not reproduce the fixed effects, but in general they are significant, as confirmed by an F-Test (see notes at bottom of table).

We first note that the cross-industry cut provides a slightly better fit than countries, suggesting that differences of adoption are more driven by industry than country. The cross-industry panel estimation also generates a positive innovation effect, *p*, for social networking, in contrary to the cut by countries. In general, all coefficients *p* (and *q*) are positive, and are all statistically significant at 5%, and thus a pure logistic model is inferior to the Bass model, confirming our hypothesis H1. Other insights are as follows.

1) Innovation rates are relatively high, more often in the 2% per year range than the 1% observed in diffusion models of high tech consumer goods.

2) Second, the ratio of imitation to innovation, (q_i/p_i (for p>0)), across technologies lies in the range of 20-25, and is somewhat larger for wikis and prediction markets than for other Enterprise 2.0 technologies. This ratio value is in the high range of inter-firm technology diffusion (Lee *et al*., 2013), but is lower than what is observed for social consumer platforms (Ribeiro, 2014).

3) Third, a co-diffusion effect is present confirming H3, and this effect is often represented by social network adoption within enterprise. The two exceptions of technologies not influenced the most by social network adoption are corporate video sharing and podcasts. Social networking in enterprise is also one of the most widely adopted technology within companies, see Table 1 above. Likewise, simple computation of q_j/q_i reveals that co-diffusion contributes 25% to the total effect of technology social contagion. In the consumer space, a large co-diffusion effect from PC to internet adoption was reported by Dewan *et al*. (2010), but was higher than the one found in this study. We conjecture that imitation and co-diffusion effects are somewhat lower in enterprise than in consumer services.

4) Fourth, the maximum ceiling penetration, *M*, does not exceed 50% for podcasts and prediction markets, in both the cross- country as well as the cross-industry panel estimation, and for wikis in the panel analysis by industry. This means that those technologies may be rather niche, and will not reach majority of adoption among firms on a worldwide basis.

5) Finally, the coefficients of the Bass model can be used to assess peak years of diffusion, with and without co-diffusion. The peak years typically are reduced by about 20% via co-diffusion. Further, typical peak is below 10 years, for blogs and podcasts, --- or from the estimated curves, roughly happened already in 2010. This confirms we are in the region of maturity of enterprise 2.0.

5. Conclusions

This article estimates a co-diffusion model of company diffusion of Enterprise 2.0 worldwide. The findings suggest that social contagion effects drive a large part of the diffusion, and are driven by a set of important economic factors. Also, co-diffusion effects prevail among technologies within enterprise, with enterprise social networks playing the largest anchor role in the full dynamics of diffusion.

In general, the pace of adoption is somewhat lower than one noticed for consumers, but still Enterprise 2.0 exhibits very strong patterns of diffusion dynamics guided by firm rank effects, and co-diffusion. In general, most technologies should reach the majority of enterprise worldwide at the exception of some niche technologies such as prediction markets.

Finally, the peak adoption has been achieved by 2010 in most developed countries if one has to believe the estimates. The key question now may be to understand how those new forms of ICT investments at scale will be transforming industry productivity and industry structure. This is left for further research.

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